Motor Age

Vol. II. No. 5 JULY 31, 1902 5 Cents

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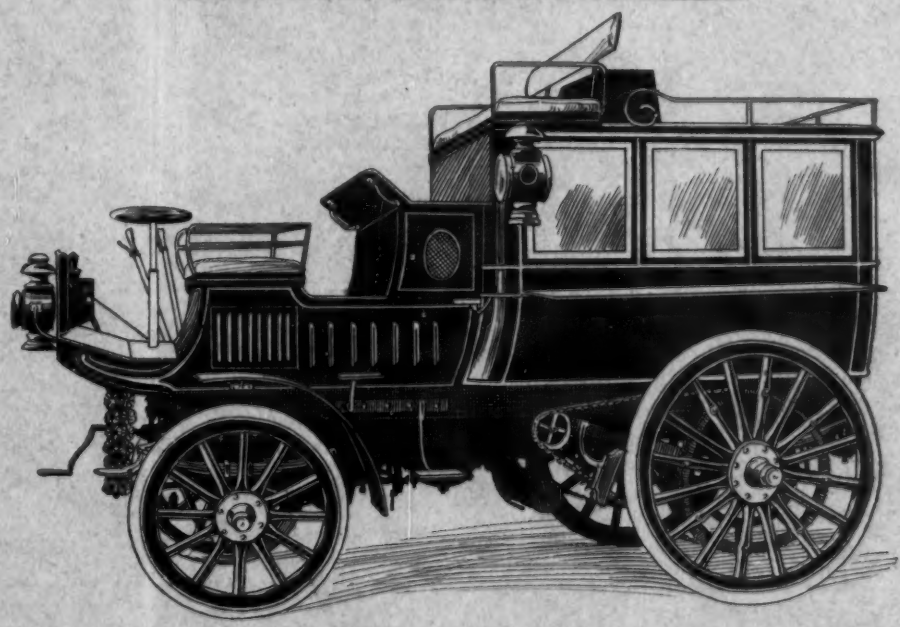

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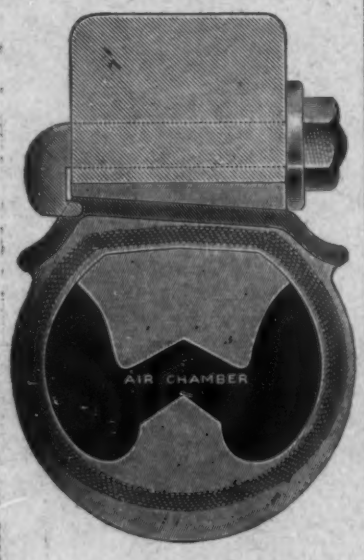

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Motor Age

WITH WHICH IS INCORPORATED CYCLE AGE

VOL. II. NO. 5. CHICAGO, JULY 31, 1902. $2.00 PER YEAR

SATURDAY'S ENDURANCE TEST.

Will Take Place This Time Regardless of Weather.—The Details and Course.

After a postponement of three weeks on account of the almost unprecedentedly wet weather with which Illinois has been favored of late, the Chicago Automobile Club's 100-mile endurance run will take place on Saturday of this week, rain or no rain, mud or no mud. The postponement resulted in the accession of several entries, the list, up to Wednesday morning, being as follows:

LIST OF ENTRIES.

CLASS A, GASOLINE VEHICLES.

	Passengers.	Lbs.	
1. Winton, 15 h. p.	4	1,950	Frank X. Mudd.
2. Winton, 15 h. p.	4	1,950	C. H. Tucker.
3. Phillips, 14 h. p.	4	1,600	J. A. Phillips.
4. Autocar, 8½ h. p.	4	1,425	W. G. Lloyd.
5. Winton, 15 h. p.	4	1,960	J. F. Palmer.
6. Oldsmobile, 4 h. p.	2	800	Olds Motor Works.
7. Oldsmobile, 4 h. p.	2	800	Olds Motor Works.
8. Elmore, 5 h. p.	2	1,000	Elmore Mfg. Co.
9. Pierce, 3½ h. p.	2	800	Geo. N. Pierce Co.
10. Packard, 12 h. p.	4	2,250	B. F. Harris, Jr.
11. Packard, 12 h. p.	4	2,200	Newton M. Harris.
12. Renault, 8 h. p.	5	1,330	Paul Picard.
14. Rambler, 4½ h. p.	2	1,200	Thos. B. Jeffery & Co.
15. Rambler, 4½ h. p.	2	1,200	Thos. B. Jeffery & Co.
16. Rambler, 4½ h. p.	2	1,200	Thos. B. Jeffery & Co.
18. Knox, 6 h. p.	2	1,400	Knox Automobile Co.
20. Unique, 4 h. p.	2	750	Fred W. Wolf, Jr.
21. Nyberg, 4½ h. p.	2	900	Henry Nyberg.
23. Holsman, 5 h. p.	2	700	Henry K. Holsman.
24. Winton, 8½ h. p.	4	1,800	Charles E. Bartley.
25. Mercedes, 40 h. p.	2	1,960	H. S. Harkness.
26. Toledo, 16 h. p.	4	2,000	F. C. Donald.
27. Oldsmobile, 4 h. p.	2	800	Olds Motor Works.
28. Northern, 5 h. p.	2	1,000	Northern Mfg. Co.
29. Darracq, 9 h. p.	2	1,250	A. C. Banker.
30. Winton, 8½ h. p.	2	1,900	Frank H. Davis.
32. Winton, 15 h. p.	5	1,950	John Farson, Jr.
33. Murray, 4 h. p.	2	900	John Henry Mears.
34. Murray, 4 h. p.	2	900	John Henry Mears.

STEAM VEHICLES, CLASS B.

17. White, 6 h. p.	2	1,400	W. H. Brown.
19. Locomobile, 3½ h. p.	2	900	Bion J. Arnold.
22. Locomobile, 3½ h. p.	4	1,000	Andrew J. McDuffee.
31. Locomobile, 3½ h. p.	2	750	Locomobile Co. of Amer.

On Friday evening there will be an illustrated lecture at the club house. Mr. Croninger, chairman of the contest committee, has prepared a complete description of the course and seventy-five illustrations which will be shown by stereopticon views. The object of the lecture is to enable contestants and observers to become familiar with the details of the event. All hands are invited to ask all the questions which seem to them necessary.

The start will be made from the club house at 9 a. m. Each observer will be required to set his watch at 9 o'clock, no matter at what time he may start, the object being to facilitate his figuring the time of arrival at controls and so prevent infraction of rules relative to speed. Every contestant has agreed "upon honor" to respect the rules.

The following description of the route is taken from the official catalogue:

Leaving the club house at 243 Michigan boulevard, you go north about 2 blocks to Jackson boulevard, then turn to the left on Jackson boulevard and cross the Chicago river to Ashland avenue; turn to the right on Ashland avenue for about three blocks, crossing two street car lines until you reach Washington boulevard; here you turn to the left until you reach Garfield Park. On entering Garfield Park turn to the left, following on through the park, passing the drinking fountain; soon after you again strike Washington boulevard. Continue west on Washington boulevard through Austin and Oak Park to Harlem avenue.

Harlem avenue is the last street in Oak Park and has a street car running on the same. On reaching Harlem avenue turn to the right, or north, follow Harlem avenue for about 2 miles, cross railroad track just before reaching Grand avenue; then turn to the left on Grand avenue, crossing railroad track soon after turning, following on through River Grove to the Desplaines bridge, which is the first control point. Immediately after crossing the river bridge, turn to the right. Following up the river after a short distance there are two railroad crossings. A little further on you come to a cross-road where you should make a sharp turn to the left which soon brings you to Kolz's postoffice. Right at Kolz's postoffice turn to the right; continue on this road for about 3 miles until you come to another cross-road. Here you make a slight turn to the left, passing the greenhouses; soon after this two large red barns are passed on the right, and continuing on Desplaines comes in sight.

On reaching Desplaines continue straight, crossing the railroad, passing straight through the town. Soon after leaving Desplaines there is a cross-road, but continue your

course directly north. Soon St. Mary's training school is passed; continuing on you come to a large red barn on the left, where the road runs very close to the river. About 4½ miles from Desplaines you come to a cross-road, where you turn to the left; after turning on this road you will notice a large red barn on the left and on the right a small white school house. One-fourth of a mile further on the road makes a turn to the right, crossing along Wooden Bridge over a small creek which empties into the Desplaines river. Soon after crossing this bridge, Wheeling comes in sight, and directly you pass the second control point.

Continue on the course directly north coming to Half Day. On entering Half Day you pass a small wooden bridge, the road turning slightly to the right, direct. In Half Day are cross-roads, but continue your course straight, passing Gratt's stock farm; continue on over excellent gravel roads to Libertyville. Two miles past Libertyville, just after passing the county farm, the road turns to the left. Soon you cross another railroad; directly after this, make a sharp turn to the right, where you come to the third control point, at the railroad crossing. Continue directly north over this road, passing Gage's Lake, where you meet a cross-road. Continue north to a large farm house on the left in front of which the road makes a turn to the right. Following this course east for about 3 miles you strike the Gurnee Pike. Here the road makes a turn to the left, and following along this course for about one mile you come to a small cluster of houses and the River bridge, where you turn to the right, continuing on, crossing the railroad, passing through Gurnee and on to Grand avenue in Waukegan.

On Grand avenue you turn southeast through Waukegan to Genesee street, crossing the bridge, following the car tracks on south, we come to the large plant of the American Wire & Steel Co., which is our fourth control point. Continue on south, passing another railroad through North Chicago; just after passing the North Chicago Railroad station cross the railroad and street car tracks to the left, and immediately after crossing turn to the right, following the street car tracks and railroad for about 3 miles to Lake Bluff.

Continue down for about 2 miles until you reach Lake Forest, and just before reaching the railroad station in Lake Forest, cross the tracks and continue on the right of the railroad tracks for about 2 miles; then again cross the street car and railroad tracks to the left, and immediately after crossing turn to the right and continue south to Fort Sheridan Railroad station. Here you cross the street car tracks only, making a turn to the left, proceeding a short distance the road leads again to the right; after this last turn we enter Fort Sheridan Reservation. Immediately after passing through the gates, the road makes a turn to the right and then gradually turns to the left, passing between the large buildings. After passing the buildings, turn to the right and continue through the Reservation, passing a number of small wooden bridges until you reach the south gate of Fort Sheridan Reservation. Here you make a turn to the left. Proceed along this road to the Lake Shore, where you make a turn to the right, following around until you strike the Sheridan Road.

You soon pass a large hotel, "The Moraine." You continue on until you come to Highland Park. At Highland Park you turn to the right on Central avenue for 1 block; then turn to the left, going south on St. John's avenue, passing the railroad station, for about 4 blocks, where you strike Sheridan Road, which turns to the left. Soon after this turn you come to the fifth control point, which is a wooden bridge over a deep ravine, just after leaving the railroad station in Highland Park.

Continue on through Glencoe, thence through Hubbard's Woods to Winnetka, following the Sheridan Road (which on account of the very legible enamel signs which appear continually along the Sheridan Road makes it very easy to follow), thence over through Kenilworth, Wilmette, on through to Evanston. Continue down the Ridge road, and just upon coming to the railroad turn to the left on Emerson avenue to Orington avenue; turn to the right on Orington avenue to University Place; here make a turn for one block on Sheridan Road to Judgeston avenue, then turn to the right on Judgeston avenue, continuing south to Main street, and turn to the left on Main street at the large brick school house for about three blocks until you meet the Sheridan Road, where you turn to the right.

Following the Sheridan Road south for about 5 blocks you come to the cemetery; here you make a turn to the left, going completely around the cemetery on the lake side. Following this course you soon come once more to Sheridan Road and continue on through Birch Wood, crossing the railroad to Deven avenue. At Deven avenue turn to the left for 3 blocks, where you again strike the Sheridan Road at the bath-house, and here you turn to the right, continuing your course through Edgewater, Llewellyn Park and Sheridan Park, passing under the elevated railroad at Sheridan Road station. One block from this you make a turn to the left, following the road for about 3 blocks to the lake, where you turn to the right down parallel with the big, broad walk going into Lincoln Park.

Here you continue your course, and upon entering Lincoln Park make a gradual turn to the left, passing the sanitarium; on through the park, passing the Chicago avenue water works, then down to Ohio street. At Ohio street turn to the right for 1 block until you come to Rush street. Turning to the left on Rush street you continue on and cross the Chicago river bridge. Immediately after crossing the Chicago river bridge you make a slight turn to the west, which brings you onto Michigan avenue, and here, turning to the right again, you continue on for about 10 blocks to the finish, making in all a course of 100 miles.

NEW INCORPORATIONS AND ENTERPRISES.

JERSEY CITY, N. J.—Berg Automobile Co., capital stock $400,000, of which 1,000 shares of a par value of $100 each are 7 per cent cumulative preferred. Registered office with Registration and Transfer Co., 15 Exchange place, Jersey City. Incorporators: James E. Hays, Camden; John Wylie and Augustus Treadwell, Jr., New York.

ROCKAWAY BEACH, N. J.—The Rockaway Motor Co. has certified to the secretary of state of New York that its capital stock has been increased from $4,000 to $5,000, consisting of shares of $50 each. The sum of $4,000 has already been issued in stock. The directors of the company include Ernest Fiedler and John May.

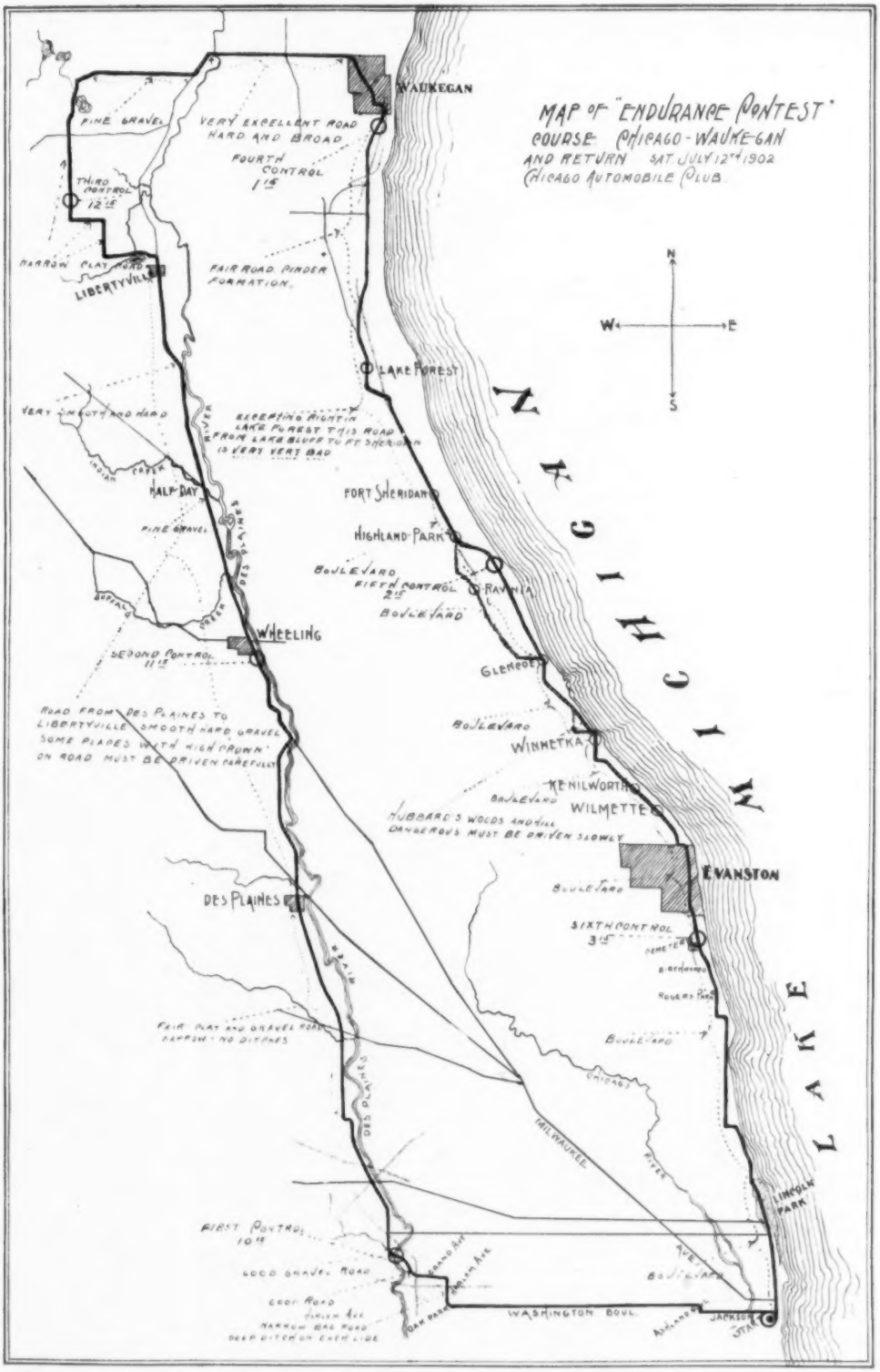
ST. LOUIS, MO.—The Mississippi Valley Automobile Co., capital stock $48,000; 480 shares of $100 each paid up. Shareholders: Harry S. Turner, Jr., 240; Max R. Orthwein, 162; Ralph H. Orthwein, 48; H. M. Caudrey, 10; George A. Meyer, 10; Henry Koehler, Jr., 10.

ST. LOUIS, MO.—Automobile Renting Co. of St. Louis; capital stock $2,000; 200 shares of $10 each, paid up. Shareholders: Harry S. Turner, Jr., 100; Max R. Orthwein, 68; Ralph H. Orthwein, 20; H. M. Caudrey, 4; George A. Meyer, 4; Henry Koehler, Jr., 4.

JACKSON, MICH.—The Jackson Automobile Co., capital $24,000, has filed articles of incorporation with the secretary of state. There are but three stockholders: George A. Matthews, president of the Fuller Buggy Co.; Charles A. Lewis, of the Lewis Spring & Axle Works, and B. J. Carter, who is the practical auto builder. They hold all the stock, there being none for sale. Negotiations are being carried on for a factory.

OSWEGO, N. Y.—The Kitts Mfg. Co. is to be incorporated. The capital stock will be $5,000. The incorporators are W. A. Kitts, F. F. Sweetland, W. L. Moore, W. B. Baker and James Harding. The manufacture of automobile steam boilers is getting to be one of the leading industries of the city. There is talk that the Oswego Steam Carriage Boiler Co. is to enlarge its plant to nearly double its present capacity.

ANGOLA, IND.—The Alamo Co. is going through the legal formalities necessary to increase its capital stock to $75,000 to enable it to manufacture automobiles, known as Alamobiles.


MAP OF "ENDURANCE CONTEST"
COURSE CHICAGO - WAUKEGAN
AND RETURN SAT. JULY 12TH 1902
CHICAGO AUTOMOBILE CLUB
WAUKEGAN
LAKE FOREST
FORT SHERIDAN
HIGHLAND PARK
RAVINIA
GLENCOE
WINNETKA
KENILWORTH
WILMETTE
EVANSTON
LIBERTYVILLE
HALF DAY
WHEELING
DES PLAINES
LAKE MICHIGAN
FINE GRAVEL
VERY EXCELLENT ROAD HARD AND BROAD
FOURTH CONTROL 1 1/5
THIRD CONTROL 12 1/5
NARROW PLAT ROAD
FAIR ROAD FINDER FORMATION
VERY SMOOTH AND HARD
CREEPING RIGHT IN LAKE FOREST THIS ROAD FROM LAKE BLUFF TO FT SHERIDAN IS VERY VERY BAD
INDIAN TRAIL
FINE GRAVEL
DES PLAINES RIVER
BUFFALO CREEK
SECOND CONTROL 11 1/5
ROAD FROM DES PLAINES TO LIBERTYVILLE SMOOTH HARD GRAVEL SOME PLACES WITH HIGH CROWN ON ROAD MUST BE DRIVEN CAREFULLY
BOULEVARD
FIFTH CONTROL 2 1/5
HUBBARD'S WOODS AND HILL DANGEROUS MUST BE DRIVEN SLOWLY
SIXTH CONTROL 3 1/5
CEMETERY
ROGERS PARK
FAIR FLAT AND GRAVEL ROAD RARELY NO DITCHES
CHICAGO
MILWAUKEE
RIVER
LINCOLN PARK
FIRST CONTROL 10 1/5
GOOD GRAVEL ROAD
GOOD ROAD
NARROW GAP ROAD DEEP DITCH ON EACH SIDE
GRAND AVE
NORTH AVE
OAK PARK AVE
WASHINGTON BOUL.
ASHLAND AVE
JACKSON STAT
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W
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S

Motor Age

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Motor Age may be obtained, by any newsdealer, through the Western News Company, Chicago, or any of its branches, which are located in every large city in the United States.

The editor will be glad to receive communications for publication. They must be accompanied by the names and addresses of senders, which will not be used if request be made to that effect. Contributions will not be paid for unless accompanied by notice that payment is expected.

Subscription, Two Dollars a Year, - Six Months, One Dollar

"WHAT MONKEY SEES MONKEY DOES."

An old German saying tells us that "what monkey sees monkey does." How aptly the remark applies to some members of the human race was illustrated lately by an incident which shows how people will sometimes copy without the formality or precaution of first ascertaining whether the originator is willing or whether that which they are about to undertake will accomplish the object they have in mind. A machinist in a city not far from Chicago had undertaken to build some small generators for a customer. They were of a new type and built on a new principle. Work was started on fifty specimens, but when a couple had been completed it was found that they would not do the work required. The result was that they and the unpaid bill were left on the hands of the maker. Some time later a friend of the machinist engaged in electrical pursuits happened in, and seeing the unfinished generators, immediately became interested and suggested that they could be altered so that they would give a spark, and that they could be sold for spark generators for automobile and stationary engines. The generators were therefore fixed in the manner suggested and disposed of at a price which reimbursed the machinist for his loss and the electrician for his time in winding and putting them in running order.

Some months afterward the machinist received a harsh and almost blasphemous letter from the manager of a large concern engaged in the manufacturing of motors for fans and dental engines. His house, said the manager, had gone to great expense in manufacturing a large quantity of these generators, but they would not do the work. He demanded to know by what right he, the machinist, had perpetrated this outrage on the public! He even intimated, in a roundabout way, that he ought to make the generators work or reimburse the house for their loss. He cited as proof of the incapacity of the generator a letter from an automobile supply dealer, who said that he had put one on a vehicle belonging to one of his customers, that it was no good, and that the shipment would be returned without delay. Whereupon the machinist laughed and quoted the German saying.

Still another true story. An owner of a small machine shop who was advertising the manufacture of automobile parts and supplies saw an advertisement in a trade paper of a speed transmission gear, which, it was claimed by its makers, was the smallest, lightest and most compact piece of mechanism in the market. He accordingly procured one of the gears, and it was taken apart and used as a standard for reproducing others of his own make. One of these, but much smaller than the original, was put in a rig to replace another type which the owner did not like. The rig was taken out by its owner one day, but after getting nearly out of town and going at a good speed the transmission device suddenly "blew up," stripping the teeth off the gears in its casing, broke the sprocket driving chain, and as the brake formed a part of the device the rig became unmanageable and ran into a fence and damaged both the owner and itself. The proprietor of the small machine shop, upon being confronted by the owner of the vehicle with the facts in the case, including himself and his machine, loudly denounced the original maker of this speed transmission, and wound up by saying, in no measured terms, that people who put such things on the market ought to go to jail!

THE AUTOMOBILE IN CITY TRAFFIC.

The frequency with which the automobile is declared out of place anywhere but in the comparative freedom of country roads suggests the inquiry whether or not a mechanically propelled vehicle, used in crowded thoroughfares, demands more care and attention than the average owner or driver is able—or apt—to give to it. Such a question calls for calm and unbiased judgment, with personal preference and self-interest alike ignored.

It is true—unfortunately—that there have been fatal accidents, but in comparatively few cases have the mishaps been fully chargeable to the carelessness or incompetence of the user of the vehicle. In a great majority of cases, on the other hand, the ignorant effort of the injured party has been the real cause of the trouble. The machine itself is less dangerous as a means of locomotion than the horse, since it is held under more complete control and is not given to impatience, viciousness or fear. True, the reckless driver may, by ill-handling of his machine, find himself in situations which inevitably lead to disaster; yet this condition arises, not from the nature of the vehicle, but from the nature of the one who operates it.

Again, many of the so-called automobile accidents are in reality horse-and-pedestrian accidents. Those who know both sides of the matter realize that the horse represents the larger possibilities of danger. We hear more of accidents of this kind now than in former years for two simple reasons—first, that the automobile has come into larger use, and second that the daily press devotes ten times as much space to a trivial automobile accident as to a fatal one in which a horse is involved. The ratio is small in proportion to the increase in the number of owners; and as for the pedestrians who are injured it will be admitted that they are largely those who do not themselves understand the ways of city traffic, and who will not try to master them. They launch themselves into the passing stream without forethought or caution. To them the noise-making possibilities of the automobile are measures indirectly of protection and safety.

MOTOR AGE will be pleased to publish communications of general interest and to reply in this column to questions of the same character in such manner as to furnish the desired information in the simplest and most direct form. Requests for articles on any specific subject will be given as early and careful attention as possible.

Jump Spark Coil for Four Cylinders.

Nashville, Tenn.—Editor MOTOR AGE: I have a four-cylinder gasoline motor fitted with the make and break form of sparking device inside the cylinders. As it is not satisfactory, I wish to use the jump spark method instead, as I find from inquiry that it is more commonly used and gives better results than the other form. Can I use a single induction coil and have a commutator or similar device to switch in the cylinders one at a time? It seems to me this would be simpler than using four coils, which, I understand, are generally used. Yours, etc.—John W. Merriweather.

There have been numerous such devices made and patented, but it is an altogether impossible proposition to switch the secondary current on account of its great intensity. It will arc around any form of commutator that could be devised of practical working dimensions. Quadruple coils which are made especially for this use can be obtained of almost any reputable supply house, being in reality four coils in a single casing. In ordering such a coil it should be specified that it should have eleven terminals or binding posts, two for the battery connections, four for the motor commutator or switching device to the primaries, four secondary wire connections to the sparking plugs and one common ground connection for the return circuit of the primary and secondary, which should be all plainly marked on the coil casing. This will avoid loss of time or confusion in making the connection from the coil and battery to the motor.

Ignition Device Fails to Regulate.

San Diego, Cal.—Editor MOTOR AGE: Recently I purchased a gasoline motor from an eastern concern to put in an automobile which I intend to have built here. It is fitted with jump spark ignition, and the speed of the motor is supposed to be capable of regulation by the same from 450 to 900 revolutions per minute, according to the circular furnished by its makers. After the motor has run for 10 or 15 minutes and gets warm, the ignition device refuses to regulate the speed, no matter what position it is placed in. Can you kindly tell me what is the cause of this difficulty and if there is any way to remedy it?—Yours, etc., F. P. N.

The probable cause of the difficulty mentioned is either that the compression is too high and spontaneous combustion or self ignition takes place after the combustion chamber has become thoroughly heated, or there is some projection inside the same which becomes incandescent. To remedy the compression trouble a new piston would be the simplest thing. It should be made with a dished head, so as to increase the clearance or capacity of the combustion chamber. If there are any projections in the end of the cylinder or valve chamber they should be removed if it is possible to do so. MOTOR AGE of July 17, 1902, page 10, in an article on "Compression and Combustion," gave information how to ascertain the compression in atmospheres in the combustion chamber. It should not exceed in good practice four to five atmospheres.

Size and Lift of Valves.

Tyler, Tex.—Editor MOTOR AGE: I am building a four-cycle gasoline motor for an automobile and am rather puzzled on one or two points. What I want to know is what is the proper diameter for the valves and how high should they lift. I want to operate both inlet and exhaust valves with cams. The motor I am making is 5 inches bore and 7 inches stroke, and I want it to run at about 600 to 700 revolutions per minute. If you can give me the desired information through the columns of your paper I shall be greatly obliged. —Yours, etc., M. K.

A table giving the proper diameter of valve openings for motors from 2½x2½ to 8x8 and at speeds from 2,100 to 450 revolutions per minute, with full instructions how to use the same, and also to figure the lift for both flat and bevel seat valves will be published next week. In this particular case the diameter of the valve openings should be 1 9-10 inches, the lift of a flat seat valve 0.47 inches and for a bevel seat valve with 45 degree angle 0.70 inches.

Jump Spark Ignition Preferred.

Battle Creek, Mich.—Editor MOTOR AGE: I have just completed a single cylinder gasoline motor, 4½ in. bore and 5¾ in. stroke. It is to run at 750 revolutions per minute and carries 60 pounds compression. Can I use a make and break form of sparking device without a coil, and, if so, what must I use instead of the coil?—Yours, etc., J. P.

Small dynamos or magneto generators can be obtained from almost any automobile supply dealer. They will answer the purpose under ordinary conditions, but with the speed and compression stated the jump spark form of ignition would be preferable and give more satisfactory results.

The Olds agency has fallen into good hands at Portland, Ore. It has been secured by Fred T. Merrill, who conducts establishments there and at Seattle, and who gives notice of his acquirement by means of a half-page announcement in the daily press.

The Sandusky (Ohio) Automobile Co. has completed its first machine. The plans for the company's new building have been drawn. It will be 60x156 feet, two stories and basement.

The assets of the Milwaukee Automobile Co., consisting of unfinished vehicles, parts and tools, have been sold to Herman Falk for $3,025. They were valued by the appraiser at $7,800. Other goods have been disposed of by private sale for $2,300.

PARIS-VIENNA—MEN AND MACHINES.

The Renault Brothers and Their Accomplishments as Engineers and Sportsmen.

Paris, July 19.—The victory of Renault's light car beating all other vehicles regardless of weight places the winning car very much to the front, as well as the men who designed and steered it. So a few words on either will not be out of place. The Renault car has a four-cylinder vertical motor, and the now famous transmission through the longitudinal "cordon" and the direct drive at high speed, which has become a classical feature of all vehicles from that firm. Paris-Vienna was the debut of the Renault in the light class vehicle department, and a sensational debut it was.

The name of Renault has all along been closely and favorably connected with the history of motorism. There are three brothers of that ilk, all three gifted with the mechanical brain, namely: Marcel Renault, the Paris-Vienna hero and winner of Paris-Toulouse on a motorette; Louis Renault, who designed the winning engine of Paris-Vienna and would probably have entered Vienna first but for a collision with Baron Caters, and Fernand Renault, the eldest of the trio, who plays the part of originator and general manager in all racing arrangements. The Renault brothers, who are of a well-to-do family, took early to motoring, not for business' sake, but for the love of it, and soon forged to the front.

One day L. Renault conceived the grand idea of coupling two seats on his motor cycle and introduced the direct drive on the differential, and thus the first motorette came to life. It was a light thing, which hardly turned the scale at 212 kilos, but so nicely designed and balanced that on its experimental tour it went right through Switzerland to Wies. Since that date, which marks a decisive step in the right direction, M. Renault has gone on further and improved on his type by adding to it the four-cylinder feature.

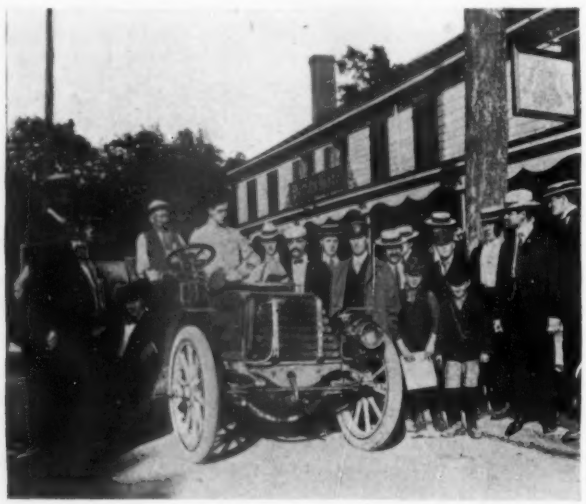
The Renault brothers are not merely engineers of rare ability, but they are also splendid drivers and sportsmen, endowed with any amount of dare-devilness and grit, as evidenced by their deeds. In Paris-Berlin Marcel Renault astonished his friends by steering to victory his motorette despite a bad wound on one hand. Louis Renault is another game one, who showed in Paris-Vienna that he could hold his own against any amount of ill-luck. He was apparently winning when Baron Caters came into collision with him, breaking his rear axle. L. Renault was delayed 3 hours on the spot to repair, and went on at top speed; but, when passing another vehicle, ran into a ditch and broke one wheel. Most other men would have thrown up the sponge in disgust. Not so with him. He walked to a neighboring village farm, got some tools and a piece of wood, carved out several pieces which replaced the spokes, mended his wheel as best he could, and moved on again and reached Salzbourg. On the next day he started forty-second on the list, to finish fifteenth at Vienna. Meanwhile his brother Marcel had avenged him by entering the Austrian capital first.

On hearing of the horrors of the Austrian course M. Renault, the ultimate winner, selected the very worst bit of road in the surrounding of Paris, a road with holes, ditches, ruts, pavements, and all the rest of it, and put on the highest speed. Over and over again he drove on the awful surface. At last something looked like giving way about the axles. On the following week all the axles had been replaced and the new ones reinforced, with the result that the new vehicle stood the test beautifully and entered Vienna ahead of all other cars.

It has been calculated that more than 100,000 liters of gasoline had been disposed of along the course for the wants of competitors. They filled no fewer than sixteen wagons. And then some of the cars fed on alcohol.

Steam Deceives Speed Guessers.

A continental correspondent writes: "I posted myself about 20 kilometer from the Paris-Vienna starting point to see the cars thunder by. The more noise these made the quicker their pace appeared. A car hove in sight. Everybody was disappointed and said 'This is not making any pace.' No sooner said than the car flashed by like a streak of lightning. It was a Gardner-Serpollet. It did not thunder, it whizzed past silently, without that well-known shaking from stem to stern or any of the stress apparent in some of the other racers. Many spectators rashly strolled in front of these Serpollets, imagining they were not going a tremendous pace because they were noiseless.



SCENES AT THE LATE BRAKE TESTS CONDUCTED BY MESSRS. SMITH AND MABLEY.

Measuring the Stop of the Panhard.

Uncle Tommy Day, Jamaica's Oldest Inhabitant, After His First Automobile Ride.

Five Gardner-Serpollets entered and five were in at the finish, leaving no fraction of themselves on the way—a 100 per cent performance, with no wastage, no break-down and no failure of any part to perform its promise."

PLANS FOR BIG ENDURANCE CONTEST.

New York, July 23.—At a meeting of W. E. Scarritt, G. F. Chamberlin and John A. Hill, the committee in charge of last year's A. C. A. endurance test to Buffalo and in charge also of the coming Boston-New York run, the date was settled for the week beginning Monday, October 6. The test will be known as a "reliance run."

The outward bound course will be by way of Bridgeport, New Haven, Hartford, Springfield and Worcester, and that this course will not be entirely repeated on the return trip Secretary Butler is to investigate several suggested routes for the latter. One is that it shall follow the shore road by way of New London and not strike the outward course before New Haven.

The knotty point to be solved, the rules as to replacement of parts, was only discussed casually. There seems to be a disinclination to make the rules as stringent as those of the first British test, when all parts were sealed, and still keep last year's promise following the Buffalo run that there should be no such laxity in this particular as occurred on the club's inaugural endurance run attempt.

A suggestion has been made that the contestants be guarded over night from any persons connected with them and that in the morning for an hour before the start such repairs be allowed as can be made within that time.

KANSAS CITY'S ENDURANCE RUN.

At the request of the secretary of the Kansas City association details of the late endurance run in that city were held over with the understanding that official results would be forthcoming in a few days. They have still to come. Fourteen vehicles started and finished in a deluge. The sky cleared during the greater part of the journey, however. The starters were one Olds, one Friedman, two Haynes-Appersons, one Foster, three Pierce motorettes, one Toledo, three Locomobiles and one De Dion. The first two mentioned became mud-bound, largely through careless operation. The De Dion went 80 miles before stopping on account of water in the carbureter. Percy Pierce claims to have made a non-stop trip, his experience in earlier contests teaching him the folly of attempting speed over roads which were frequently covered inches deep in water. A Haynes-Apperson finished in 6h. 41m., a Foster in 7h. 16m., a Pierce in 7h. 25m. and a Locomobile in 7h. 30m.

The run seems to have resulted in a heated argument among the club members. A meeting was held but no awards were made, as all of the observers had not filed their reports. It was decided to put off this matter until the next meeting and disqualifications will follow a failure to turn in a report by that time. There are several claimants to red and white ribbons but only one contestant asks for a blue ribbon and there is a protest against this one. Immediately after the run P. P. Pierce, who operated a Pierce motorette, claimed a blue ribbon, averring he had made the full mile endurance course without a penalizing stop. It is charged by other contestants, however, that he is not entitled to his contention. There were three machines that passed Pierce on the roadside about 5 miles east of Independence and the men in all of them say he was "hung up for repairs." Some say he had a monkey wrench in his hand and was repairing his machine. Mr. Pierce's observer had not made a written report, but was quoted as having said that Mr. Pierce's claim for a blue ribbon was just.

When E. P. Moriarty, the agent for the Pierce machine, learned that a protest had been filed against awarding his machine a blue ribbon, he grew warm and had a heated discussion with D. F. Piazzek, the author of the protest. Mr. Piazzek confessed to having made two stops on the trip, thereby disqualifying him for a blue ribbon, but he asked for a red ribbon on the strength of having finished in the time limit of 6 hours. Mr. Moriarty, it is charged, hung a sign on his machine in his show window after the race, which announced that his was the only machine that won a blue ribbon in the endurance contest. As no official award has been made this naturally incensed the other dealers greatly, yet they say they have a disposition to give Mr. Moriarty a fair hearing on his claims. The matter has created a good sized sensation among the members of the automobile club and the dealers' association.

RABID ANTI-AUTOMOBILISTS ARE ABROAD.

The automobile enthusiasts at Warren, Ohio, and, as a matter of fact, those of the whole of northeastern Ohio, are disgusted at the ridiculous ordinance recently framed by the city fathers of the thriving town of Ravenna, Ohio. The new measure provides that any one who operates an automobile faster than 5 miles an hour shall be liable to a fine of $100 or imprisonment for one month, or both. The measure is calculated to kill the automobile business in that town and to cause tourists to give it a wide berth. It is a surprising contrast to the new ordinance in Cleveland, which provides only a slight fine for exceeding the speed of 15 miles an hour in any section of the city except the heart of the business district, and even there a speed of 8 miles an hour is permitted.

The board of governors of the Meadow Club, of Southampton, L. I., has prohibited automobiles from entering the club grounds and has petitioned the Long Island Railroad Co. to prohibit their entry to the depot grounds. Automobiles have also been barred from the estate of R. H. Burton on Long Island, on which are the cottages of a number of well-to-do people. The driveways to the property are 18 feet wide and splendidly surfaced, which may, perhaps, account for the high speed of automobiles, of which the cottagers complain.

A new law went into effect at Toledo last Monday limiting the speed of automobiles to 10 miles an hour.

Livingston Smith, district attorney, who resides at Riverhead, L. I., has arranged to post notices throughout the county offering $50 reward for proof of violation of the speed law, which places the limit at 8 miles an hour in towns and villages, 20 miles an hour in the country and 4 miles an hour on bridges.

The authorities of Glencoe, a suburb of Chicago, have been unnecessarily active of late in their efforts to suppress scorching. On Sunday last they resorted to such methods as the placing of fallen trees across the road. Many law-abiding automobilists, who have no sympathy with the operators who are responsible for this crusade, assert that it has reached a stage akin to persecution, and it is not improbable that a test case will be undertaken to ascertain whether these stoppages of the highways are legal.

A member of the Chicago club was recently touring in the neighborhood of South Haven, Mich., and passed a horse tied to a hitching post. The animal either kicked the post over or broke the halter and bolted. Returning by the same road an hour later the automobilist found the owner of the horse seated by the roadside, shotgun in hand, and was invited in language more forcible than polite to leave his machine and catch the horse. It was an embarrassing position, but discretion triumphed over valor, with the result that the

Chicago man spent an hour tramping through muddy plowed fields until the refractory animal was finally landed. The owner has since repented and has tendered the most abject apologies, to no effect, however, for he is in the hands of the authorities awaiting trial.

MOTOR LEAGUE OFFICERS AROUSED.

New York, July 29.—The American Motor League is after District Attorney Niemann, who has been making the crusade against automobilists and motor cyclists on the roads of Long Island, especially on the Merick road near Freeport. The league is aroused in earnest and arrangements have been made for several of its members to be arrested and to take up the cudgels at law in their behalf and find out what law of the land, if any, justifies the arrests being made under the conditions that they are. There seem to be two questions involved—one of law and the other of fact. Secretary S. Wallace Merrihew, of the American Motor League, recently wrote to District Attorney Niemann asking him several questions, with the idea of ascertaining whether he was making the arrests under the highway act, otherwise known as the Doughty bill, passed in 1901, or under the Cocks bill, which was an amendment to the penal code, passed in April, this year. The reply from the district attorney plainly indicated that he was operating under the Cocks law, which says that no motor vehicle shall be driven faster than 8 miles an hour within the limits of any city, town or incorporated village, nor faster than 20 miles an hour on the roads outside of cities, towns and villages. The highway act, or Liberty bill, has a clause which reads:

"No ordinance, rule or regulation adopted by the authorities of any municipality shall require an automobile or motor vehicle to travel at a lower rate of speed than 8 miles per hour within any city, town or village of the state in the built-up portion thereof, nor at a lower speed than 15 miles per hour where the same is not built up."

There is plainly a conflict between the two laws, and the question is, which has precedence? If the highway act, which is a statute law, has precedence over the Cocks amendment to the Penal Code, the recent arrests at Freeport would seem to be illegal, for the arrests were made on a country road, flanked by farm lands and meadows, and could not be called a "built-up" portion, although within the corporate limits of Freeport. The charge made was that the autoists were exceeding 8 miles an hour, but, under the highway act, it is permissible to drive at 15 miles an hour where it is not "built up."

After the Cocks bill had become a law this conflict in the two acts was discovered and some of the astute lawyers of the Automombile Club were asked for opinions. There was a difference of verdicts, but the strength of the decision was in favor of the state statute. The American Motor League has decided that the time has come for this matter to be settled.

The question of fact is whether or not the constables who make the charges are capable timers, and whether, by their method of signaling from one end of a course to the other correct time can be taken. No such method would be allowed in any branch of sport, and it has been said by one of those arresteed—W. H. Owen—that the constables have only ordinary timepieces and not even stop watches. Yet the testimony was given in court that one man—G. M. Fisher, of Brooklyn—was moving at the rate of 9 1-16 miles an hour! The American Motor League thinks it is time that the accuracy of District Attorney Niemann's methods should be tested.

DRIVING A HORSE TO DRINK.

Arthur N. Jervis, long known as a clever writer on cycling in the daily and weekly press, is now conducting the automobile column in Daily America, which, by the way, is now under the management of Harry Palmer, well known to the motor, vehicle and cycle trade. Here is a sample of the spicy dishes Jervis is serving up in his new line of journalistic endeavor, which the writer insists is a true story:

Jervis declares in all seriousness that a horse is drinking himself to death in Flushing, L. I., because of the automobile. The animal is hitched to a horse-watering fountain in the chief square of the town for the best part of the day, from one week's end to the other. He was originally driven to drink because the automobilists were in the habit of going at such a high rate of speed that they rounded the corner of Main street and Broadway on two wheels. That is, they did according to the statements of the natives. The turn there is a wide one and can be taken at speed because of the park that lies with its nose abutting

THE CLUB HOUSE AND DUTCH ROOM OF THE AUTOMOBILE CLUB OF AMERICA

Main street. The route is a popular one with autoists, as they come from Long Island City or Jamaica and turn east on Broadway for Roslyn and the many other places where there are palatial summer homes. One day some autophobe discovered that when a wagon driver stopped at the fountain in the square and let his wagon stand across the road while his horse drank there was so little room left that an automobile had to be slowed down and taken around the corner carefully. Then a brilliant idea struck the autophobe. Why not always keep a horse and wagon there? A couple of fellow haters of the most modern vehicle approved the idea and agreed to share in the slight expense of keeping a rattle-trap peddler's wagon and a bony nag at the watering basin during certain hours of the day. There was enough anti-automobile sentiment in the town to permit of it, and so it came to pass that the poor horse was driven to drink and by a leathern strap made fast to the flowing bowl. There he is taken every day now and tied, while the wagon stands across the road. The automobilists, having no need to water their steeds, do not discover the strap that fastens the horse and exposes the trick, and the natives when they want to water their horses put up with the inconvenience of manœuvring into a place alongside of the poor beast that is helpless in the bonds of the drink habit.

Motor vehicle journalism has certainly gained a splendid recruit in this imaginative Jervis.

RACES AND A CLUB FOR MINNEAPOLIS.

Minneapolis, Minn., July 29.—Automobile races will in all probability be a feature of the state fair this year. The races will be held on the mile track and prizes will probably be offered in four classes. Two special prizes will be given for gasoline autos, the dividing line being either 1,200 or 1,500 pounds. Possibly the number of classes may be increased to three. Another class will be restricted to steam vehicles, and a fourth prize will be given for the best mile against time.

The plans for an automobile club, which have been tentatively discussed at various times during the last year, appear to have taken definite shape. George Christian and Alf Pillsbury have been constituted a committee to push the project, and it is believed that nearly all of the chauffeurs in town will be induced to join the proposed organization. There are now about 125 autos in Minneapolis, a sufficient number to guarantee a large membership for the club.

Expensive French Machines for America.

A cablegram says that George A. Kessler, of New York, has bought a 40-horsepower Mercedes, the total cost of which will be $14,000; Geeorge Whittel, Jr., has ordered a 22-horsepower Mors racer at a price of $7,100; Oliver Belmont, who is now at Carlsbad, is having constructed a 15-horsepower Mors for $4,800, and an order has been received from John B. Ellison, of Philadelphia, for a $2,600 8-horsepower Mors. G. Levy, of New York, has been booked for a similar machine and C. C. Walker, of Chicago, is on the list for a 15-horsepower Mors at $5,000.

Protective Association Suggested.

New York, July 28.—It has been proposed and seriously discussed here among leading automobile crusaders that a national protective league be established. The suggestion comes from A. D. Proctor Smith, of Smith & Mabley. The idea is to regularly retain lawyers throughout the country who shall defend the members in case of arrest and otherwise be perpetual guardians in the courts of their rights. It needs but this mere statement of the purposes of the proposed league to give one an idea of its comprehensive and valuable possibilities. Those who have studied the proposal declare it to be perfectly practicable and are confident that it will receive liberal and general support as soon as its details are made known.

The Danville (Ill.) Automobile Club has been organized with the following officers: president, W. W. Keefer; secretary, Jesse Doney; treasurer, Robert Holmes. The following were listed as charter members: W. W. Keefer, Jesse Doney, Grant Holmes, Jacob Kuykendall, Ned Kelley, Harry Abdill, Flossie Holmes, Mr. Slaughter, Adam Samuels, Thomas Shehan, Will Connelly, Robert Holmes, E. J. Ryan, I. S. McFerrin, Earl Chambers, William Holmes, Mr. McClain, William Hartshorn, Captain White, George Wright.

Walter L. Githens has resigned the secretaryship of the Chicago Automobile Club and W. H. Chamberlin has been elected in his stead. Mr. Chamberlain is a comparatively new member, but has rendered excellent service on one or two occasions, particularly as a member of the local legislative committee which was consulted by the city authorities relative to the ordinance recently adopted.

Complaints are heard that the Massachusetts club, despite its membership of 200 and the possession of one of the best club houses in America, is doing nothing for the interest of the sport. An eastern paper suggests that this is due to the fact that trade men are not allowed to take any part in the affairs of the club.

Automobile races are to take place at the fair grounds, Belleville, Ill., on August 3. It is reported that John H. French and H. J. Turner, both well known in the trade at St. Louis, will compete.

A Massachusetts automobilist recently made an individual endurance run in a steam carriage from Boston to Alton Bay, N. H., and return, a total distance of 220 miles, at an average speed of 12 miles an hour, and with no accident of any kind, the first stop being for luncheon, 81 miles from Boston. From Boston to Dover, N. H., he reports the roads in good condition; from Dover to Rochester they were fair, but from Rochester to Alton Bay he found them very sandy.

William H. Seymour, of Brockport, N. Y., celebrated his 100th birthday last week, starting the day's celebration with an automomile ride.

Automobile races are to be a feature of the Taunton Fair, to be held at Taunton, Mass., September 22 to 25, inclusive. Monday, the 22d, is to be given over to an automobile meet, the races for various types of vehicles. A committee, consisting of Dr. Arthur R. C. Crandell of Taunton, Dr. C. S. Holden of Attleboro, and Frank Talbot of Norton, has the affair in charge, and information can be obtained from Dr. Crandell at 67 Spring street, Taunton, Mass.

The death is recorded, at Marshall, Mich., of Charles H. Weld, once well known in the cycle trade. He was for a time superintendent of the Royal Cycle Works of Marshall, which position he held about 4 years. He then went to Providence and became a member of the firm known as the W. W. Whitten Cycle Mfg. Co. About the year 1898 he went on the road as manufacturer's agent, representing Otto Konigslow, of Cleveland. As a testimonial to his worth in the capacity of traveling salesman Mr. Konigslow named one of his models in 1898, The Weld.

Holcombe & Co., of 100 Lexington avenue, New York, announce in another column their desire to purchase brazed, upturned handle-bars, B. S. A. pedals, bells, coaster brakes, 24-inch chainless bicycles and bicycle sundries. This firm is a large importing house which has done an extensive business with cycle makers and will establish as important a connection with the automobile industry.

The A. B. C. of the Gas and Gasoline Engine

22. Having in the first article described the operation of the principal parts common to both two and four cycle engines we will proceed to describe and illustrate the parts themselves. Of these the cylinder comes first. It is a tube made of cast iron, whose walls vary in thickness, according to its size. The smallest cylinders in common use are about 3 in. bore and 3 in. stroke and give about ¾-horsepower. The largest sizes commonly used run as high as 20 in. bore and 40 in. stroke and give 75-horsepower. One end of the cylinder is capped. The piston enters at the other end and travels backward and forward the length of the cylinder, propelled by the explosion which occurs at the capped end. The cylinder has various openings for the admission and expulsion of gases and lubrication. The success of the engine depends on the perfect fit of the piston within the cylinder.

23. Bolted to, or sometimes an integral part of the cylinder is what is known as a valve chamber. It is shown in Figure 9. Its purpose is the reception of the of the inlet and exhaust valves, and to it the ignition device is generally attached. The charge of gas is taken through it into the cylinder. It would be possible to make this a part of the cylinder proper, but the engine is simplified in manufacture by the use of the separate combustion chamber, besides which, should any trouble occur with the valves, the chamber may, if necessary, be easily removed.

24. Figure 3 is an outside view of the piston P, showing the grooves into which piston rings R are fitted. One of the piston rings is shown in Figure 4. The rings are for the purpose of insuring a tight fit between the piston and the cylinder, this being necessary, of course, to retain the pressure in the cylinder and to make it both air and gas tight under pressure and yet allow the piston to move freely in the cylinder. The rings are originally made slightly larger than the bore of the cylinder. A small piece is then cut out, as shown in the drawing, so that when placed in the grooves and the piston is placed within the cylinder they press outward against the cylinder wall.

25. Inside of the piston is what is known as a wrist pin, which is nothing more nor less than a plain round pin passing through the piston at the point indicated by the black circle. To this wrist pin one end of the connecting rod is fastened.

26. The connecting rod C is shown in Figure 5. The left-hand end fits the wrist pin. The other end, with its removable cap, attaches to the crank pin which, with the crank shaft, is shown in Figure 6.

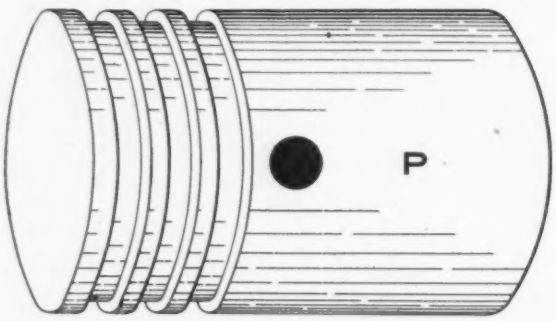


Figure 3. Piston.

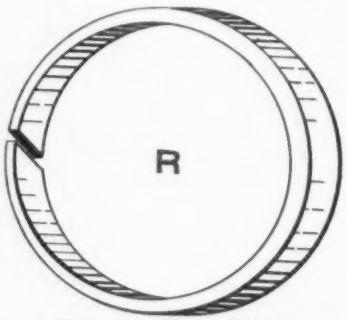


Figure 4. Piston Ring.

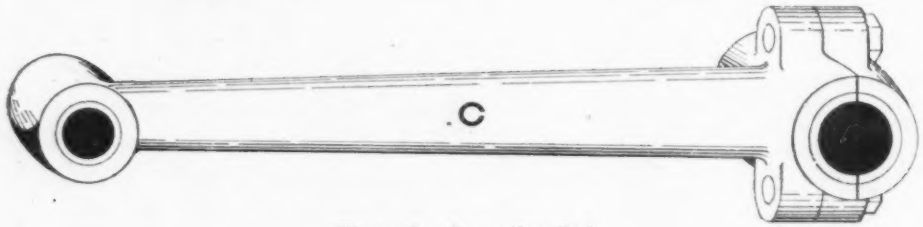


Figure 5. Connecting Rod.

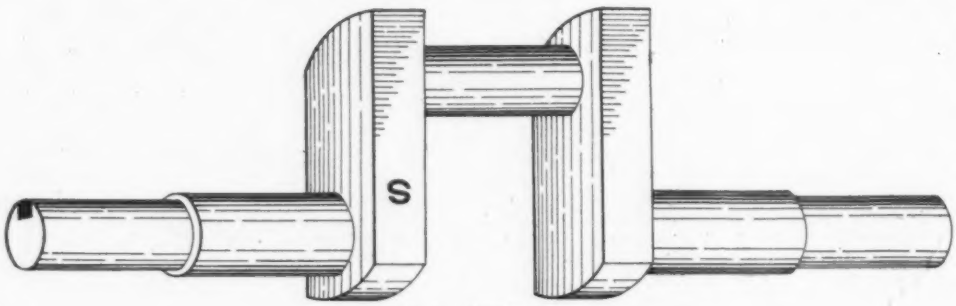


Figure 6. Crank Shaft.

27. The form of the valve and stem with the cap which holds the spring in place, the hexagon nut and split pin, which keep the cap in place, are shown in Figure 7. The position of the valves when assembled and in operation is shown in Figures 1 and 2.

28. Figure 8 shows a vertical, longitudinal cross section through a complete four-cycle stationary type of engine. That is to say, it shows the engine as it would appear if cut in two lengthwise vertically so that one-half of the interior of the cylinder is exposed. B illustrates the base usually made of cast iron, whose purpose is to support the cylinder and crank shaft bearings. G is the cylinder and H its cover or cap, which is bolted to it so that, by its removal, the interior of the cylinder may be exposed. P is the piston and C the con-

necting rod, which, as we have already seen, attaches to the wrist pin inside the piston at one tnd and to the crank shaft at the other, so that as the explosion occurs inside the cylinder the resulting motion of the piston is transmitted through the connecting rod and crank shaft to the fly wheel. The crank shaft, whose form we have already seen in Figure 6, is indicated by S. J is the crank shaft journal bearing and F is the flywheel. D is a passage from the cylinder to the valve chamber. (See paragraph 23.) The valve chamber is not shown in this drawing, but will be found in Figure 9, in which it appears to the left of the drawing, the right-hand or cylinder part of which represents a cross section through the cylinder. In this valve chamber is the inlet valve, whose action is described in paragraphs 16 and 17.

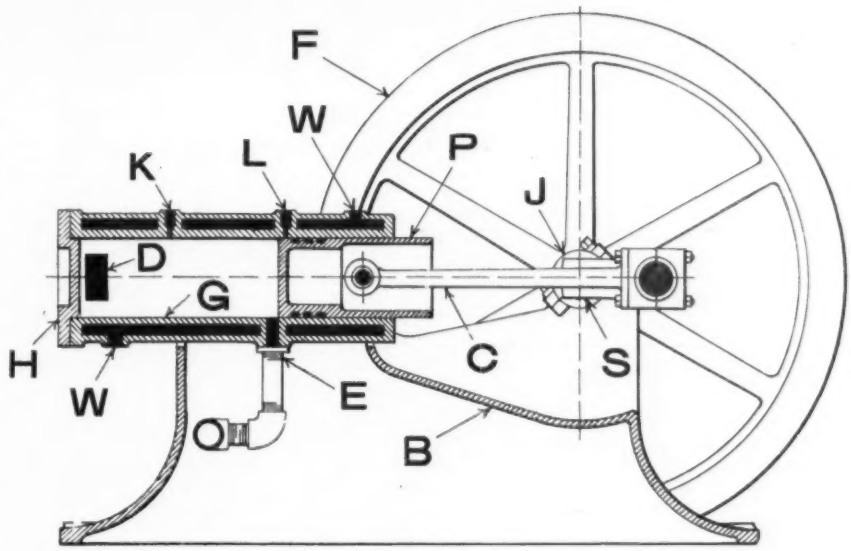


Figure 8.

B—Base, C—Connecting Rod, D—Port to Valve Chamber, E—Relief Exhaust, F—Fly Wheel, G—Cylinder, H—Cylinder Head, J—Crank Shaft Bearings, K—Compression Relief Cock Opening, L—Lubricator Boss, P—Piston, S—Crank Shaft, W—Water Jacket Openings.

29. In addition to the exhaust valve most stationary engines have an auxiliary exhaust port which is shown

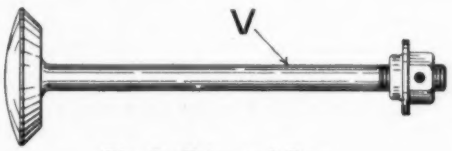


Fig. 7—Valve and Stem.

at E, Figure 8. This part is uncovered by the piston P just before the end of the outward stroke is reached and a little before the opening of the main exhaust valve occurs. The object of this is to relieve the main exhaust valve of all stress due to the pressure of the gases at the end of the stroke, to add to the length of life of the valve and to reduce the noise of the exhaust.

30. We have previously seen that the cylinder is water jacketed or, in other words, that a casing over and around it is provided in which water is circulated to keep the cylinder cool. This chamber is plainly shown in Figure 8. In it are threaded openings W for water pipes, to be connected with a water circulating tank or to a hydrant. The necessity of this circulation of water will be better understood when it is stated that at the moment of ignition of the charge the temperature inside the cylinder is between 2,000 and 3,000 degrees Fahrenheit.

31. A threaded opening is shown at L. Into this an oil cup is screwed. This oil cup is provided with what is known as sight feed; in other words, a glass tube which enables one to note the feed of the oil into the cylinder. But for the circulation of the water lubrication would become impossible. Without going into details of all the causes it may be explained here that the oil would be immediately burned by the heat of the cylinder, resulting in a deposit on the piston and cylinder, which would make it impossible for the former to operate.

32. The threaded opening K is for the reception of a cock for the purpose of reducing the size of the charge in the cylinder in starting the engine. By turning the flywheel the charge is drawn in. The cock is then opened and the piston is pushed to the end of its stroke. The compression in the combustion chamber is thus reduced so that the engine may be easily turned over by the operator in starting.

33. Figure 9 is a cross section through the cylinder and valve chamber at the line of the combustion chamber of the engine, showing the inlet valve A, exhaust valve E and water jacket space around the cylinder

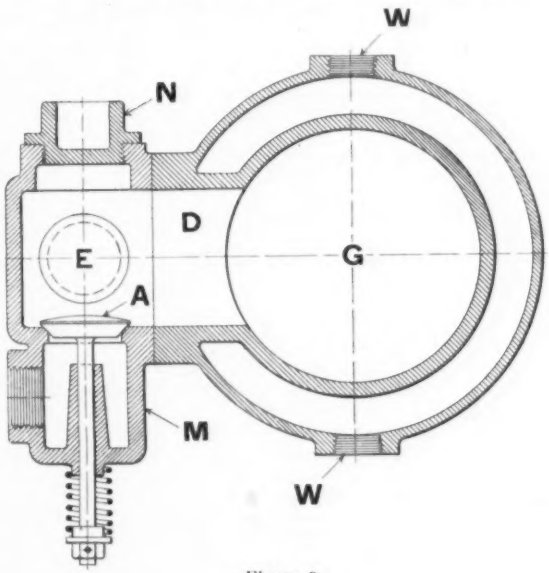


Figure 9.

A—Admission Valve, D—Port to Valve Chamber, E—Exhaust Valve, M—Valve Chamber, N—Removable Plug, W—Water Jacket Pipe Connections.

body. The valve chamber M is shown at the left-hand side of the cylinder, as is the passage D between the cylinder G and the valve chamber M. The inlet or admission valve A is located in the bottom of the valve chamber M, while the exhaust valve E is shown to the left and directly on the center line and parallel with the cylinder G. A screw plug or cap N is provided at the top of the valve chamber M so as to facilitate removal of the inlet valve A when necessary, the latter being directly beneath and concentric with the opening in which this screw cap fits. The threaded openings W are for the water pipe connections for cooling purposes.

TESTING WITH PRONY BRAKE.

Two of the Simplest Forms of Ascertaining Actual Horsepower.

There are many and devious rules and methods given in text books for ascertaining the horsepower of the various types of motors. All of them are based upon empirical formulas or arbitrary data from theoretical or other intangible sources. There is one, and only one, way in which to ascertain correctly the actual horsepower developed by steam, gasoline or electric motors, or other sources of power. That is by the use of the Prony brake, so called after its inventor. This device will give the actual energy in foot pounds per minute delivered by the motor at its driving shaft, and this, divided by 33,000, gives the actual horsepower of the motor.

Figure 1 shows one form of the brake in which two brake blocks B partially surround the pulley and are attached to the clamping or holding pieces D and F, which in turn hold the brake blocks flexibly upon the pulley by means of the bolts A, springs G and thumb nuts N. The lever C is made double-ended for the dual purpose of balancing itself and supplying a means to balance the weight of the spring scale S, by means of the weight W, at the opposite end of the lever C.

In using this form of Prony brake the brake blocks B are placed around the pulley P, as in the drawing. The bolts A are tightened sufficiently to hold the device in place; then the spring scale S is attached to the screw eye E, which is fastened to the floor as shown. The motor is then started up in the direction indicated by the arrows on the pulley P and the springs G tightened by means of the thumb nuts N. Then the reading of the scale S and the speed of the pulley P, in revolutions per minute, are taken.

The motor should be preferably tested at varying speeds, and the pull on the scale S noted for each. Then the actual horsepower can be calculated for each test from the accompanying formula and the results compared to find out what speed of the motor gives the most efficient result.

The following formula will give the actual horsepower in the type of Prony brake shown in Figure 1:

Let L be the length of the scale lever in inches.

And S the weight indicated by the spring scale in pounds.

If N be the number of revolutions of the pulley per minute,

And B. H. P. the actual brake horsepower of the motor, then

$$\text{B. H. P.} = \frac{L \times S \times N}{63{,}025}$$

Example: A 2½x2½ air cooled motor with 3 in. diameter pulley has brake test made with 12 in. scale lever. Speed of motor was 1,200 revolutions per minute, and pull on scale 8 pounds. What is the actual brake horsepower of the motor?

Answer: Twelve inches multiplied by 8 pounds and by 1,200 revolutions equals 115,200; this divided by 63,025 gives as a result 1.84 as the brake horsepower of the motor.

Figure 2 shows another form of Prony brake, better adapted to higher powered and slower speed motors. The brake band B embraces the upper half of the face of the pulley P, and is connected at one end to the spring scale S and at the other to the weight lever C by the lugs D. The spring scale S is attached to the floor by the screw eye E and the weight lever C is supported by the eye bolt F with adjusting nuts N and bracket A. The formula for this type of Prony brake is here given:

Let S be the weight indicated by the spring scale in pounds,

And R the radius of the pulley in inches,

And N the number of revolutions per minute of the pulley.

As B. H. P. is the actual brake horsepower,

$$\text{Then B. H. P.} = \left(-\frac{L \times W}{G}\right) \times \frac{R \times N}{63{,}025}$$

Example: Required, the brake horsepower of a 6x6 engine, at 600 revolutions per minute, with the following brake test data. Pull on spring scale 100 pounds; L is 12 inches and G is 4 inches and weight W, 5 pounds; R is 6 inches.

Answer: 100 pounds minus (12 divided by 4 and multiplied by 5) equals 85 pounds as efficient pull on brake band. Then 85, multiplied by 6 inches and by 600 revolutions, equals 306,000. This divided by 63,025 gives 4.84 brake horsepower for the engine.

In making these tests it is best to test the motor at varying speeds both above and below its rated speed, as in some cases a slower speed test with heavier pull on scale will show greater power than one with higher speed and lighter pull on the scale. In this manner what is generally known as the critical speed of the motor, or that speed at which it gives its greatest brake horsepower, can be readily ascertained.

NEW TYPE OF STEERING MECHANISM.

A steering device well worthy of attention, in view of the fact that there are so few satisfactory steering devices in use, is shown in the accompanying drawing. One of the greatest defects of the worm gear steering mechanism is the lost motion between the worm and the

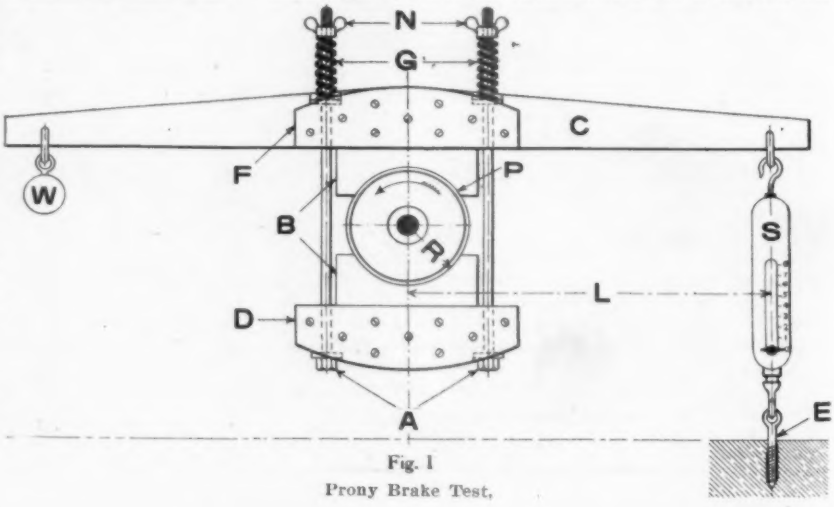
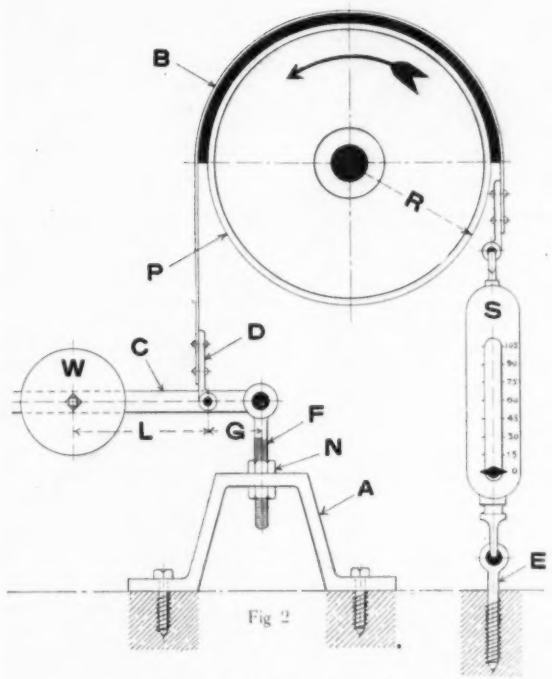


Fig. 1
Prony Brake Test.



Prony Brake Test, Fig. 2.

worm gear which occurs after brief use. There is no practical or mechanical method of taking care of this, except the use of eccentric bushings on either the worm or worm gear shafts, and even when this is resorted to only a few thousandths of an inch wear can be taken care of because the worm and gear would be forced too closely together, to admit of practical working, beside throwing off their pitch lines. In the device shown all wear can be taken up, and consequently there is no lost motion at the steering wheels, for after being in use until a little wear occurs, it is only a moment's work to correct the defect.

By reference to the cut it will be seen that the angles A, support the brackets B, which carry between them the hub D, of the steering spindle E, by means of the bosses C. At the lower end of the spindle E, is an extension portion F, having a flat topped V thread as shown. This is surrounded by a split threaded sleeve G, with lugs H, for adjusting screws to take up the wear between the sleeve G, and the threaded extension F. The bell crank lever N, has an upper forked end in which the sleeve G, is swiveled. The lower end of N, has an arm which is attached by the rod M, to the steering knuckles of the front wheels. The downward pull of the screw N, is taken care of by the washer J, with lock nut K, on the stub end L, to which the steering wheel and shaft are attached. The forked end of the bell crank lever N, is not slotted, but is pivotally attached to the sleeve G. When the bell crank lever end moves forward or backward the hub D, of the steering spindle E, receives a slight oscillating motion, which, of course, is communicated to the steering wheel, but is so slight that it is not noticeable. All slotted forks or joints in which play may occur are avoided, and all that is needed to make the device practically without lost motion, is adjustment when necessary of the sleeve G.

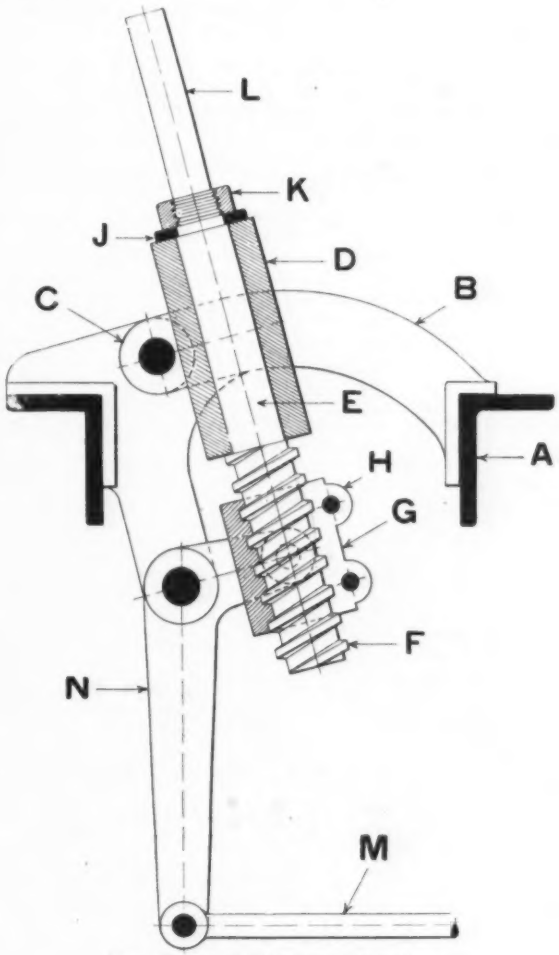
An Unnecessary Warning.

Over in Holland when they speak of an automobile they call it a suelpaardaloozonderspoorwegpetroolryting. A traveler who has just returned from that country says that one day as he was walking along one of the country roads between Amsterdam and The Hague an excited woman ran out of a house and called to her little son, who was playing in the highway:

"Hendrik, come from the roadway. There comes a suelpaardaloozonderspoorwegpetroolry—never mind. It's gone now."—Chicago News.

Holsman Gasoline Automobile.

A new candidate for public favor is the Holsman automobile, made by the Holsman Automobile Works, with offices at 153 La Salle street, Chicago. The vehicle is propelled by a gasoline motor and operated by means of a rope drive pulley for the forward and a V groove friction pulley for the reverse. The pulleys are on a secondary shaft driven from the motor by a sprocket chain. This form of power transmission to the rear wheels is not new, Max Hertel, of Chicago, having constructed a light vehicle over nine years ago with this style of driving mechanism, which he afterward abandoned. Dispensing with the differential gear makes it necessary for the wheels either to skid or slip the rope or friction drive when rounding corners or else for the operator to throw the mechanism out of gear when turning, which in most cases is impracticable.



New Type of Steering Mechanism.

HAYNES-APPERSON CO. DOUBLES CAPACITY.

The Haynes-Apperson Co., of Kokomo, Ind., has made arrangements for the erection of a new establishment, which will about double its capacity. People who have visited the present factory will readily understand the truth of the statement that this addition will make the Haynes-Apperson factory one of the largest in the world. The new building will be 41 by 280 feet, two stories high and will be the second one of that size constructed during the present year, the first having been completed and occupied only 6 months ago. To keep pace with the requirements of the product of this new building the company is also arranging to double the capacity of its brass and aluminum foundries and is erecting a new office building separate and apart from the factory.

All this is the result of the inability of the company to keep pace with the demands made upon it. It is estimated that continuous work until the middle of September will be necessary to fill the orders at present in hand. The addition will give the factory a total floor space of about 75,000 square feet. The new building is to be of brick, stone and iron.

SHANKS REMAINS LOYAL TO WINTON.

Cleveland, Ohio, July 29.—The Winton Motor Carriage Co. will open a retail store and storage house in the business section under the management of Charles B. Shanks. It was Shanks' original intention to handle Wintons, Buckmobiles and the product of A. L. Moore's factory. The Winton company made him a proposition to abandon his plan. The inference is that the company preferred to retain the exclusive services of the enthusiast who has helped to make Wintons famous, and, incidentally, that the concern will be in the field another season with a medium-priced machine; hence the exclusive Winton policy. The store selected is in the Masonic Temple building, within a stone's throw of the Hollenden and other prominent hotels. The establishment will have a frontage of four wide store rooms about 25 feet deep. Back of the partition is a store room of the same length and fully 50 feet deep, facing on Rockwell street. The basement is twice as large as the ground floor, as it extends under three sidewalks. The Bond street side will be utilized for office and store room and there is window frontage sufficient for three or four vehicles, with room for several more on the floor. The larger room will be used for storage, while the basement will be utilized as a repair shop, wholly separated from the store. Sundries will probably be handled at wholesale and retail and it is probable that arrangements will be made with a rubber company to establish a branch store and repair shop.

Mr. Shanks will continue to act as Mr. Winton's right-hand man in race meets and tours; he will continue to edit Auto-Era; he will continue to handle the Winton advertising, no small task in itself, and he proposes also to handle the output of the Buckmobile factory throughout the west, although, as intimated, this machine will not be handled at the new store. Incidentally, for recreation, he will act as chairman of the race committee of the Cleveland Automobile Club and will help manage the Detroit races this fall.

Rapid progress is being made on the Winton factory and it is expected that a portion of it will be running by the middle of next month. Mr. Winton has just completed a 90-horse power gasoline engine, an enlarged duplicate of the machine used in the Winton touring car. This is one of seven which will be utilized to furnish power for the big Winton plant and, incidentally, to act as a practical demonstrator of the correctness of the theory of the Winton practice.

THE TOLEDO TOURING CAR.

Last week's issue contained an illustration of the new Toledo touring car, just turned out by the International Motor Car Co., of Toledo, and an early issue will furnish a detailed description and drawings of what has been pronounced by many judges the finest car ever produced in America. Meanwhile the following details will prove interesting:

The 16 horsepower motor is of the three cylinder vertical type, 4¼x5¼ each. Cranks are set at 120 degrees. The power is conveyed through a fly-wheel clutch of 16½ inches diameter to the primary shaft of the transmission gear, which is equipped with the necessary sliding gears to permit three forward speeds. The reverse is effected through an intermediate pinion interposed at will between the first speed gears, thus reversing the direction of rotation of the secondary shaft. This shaft transmits the power by bevel gearing to the spur differential carried on the cross countershaft. The counter-shaft is provided with two long bronze bearings attached to the frame of the vehicle and a 16-toothed sprocket is carried at each of its extremes. The counter-shaft is provided with universal joints to compensate for any alteration of alignment due to road stress, etc. Five-eighth-inch roller driving chains of 1¼ inch pitch carry the power to two 16½-inch 40-toothed sprockets bolted to the spokes of the driving wheels. The driving sprockets are also provided with 1¾-inch brake drums, the band brakes being actuated by the outside hand lever.

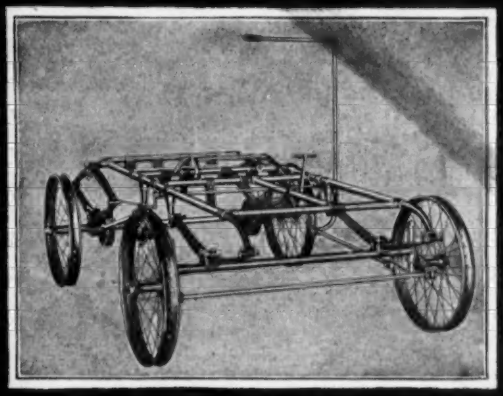
The speed of the motor is controlled by a throttle governor, attached to the inside face of the cam shaft gear. A hand lever controlling the spark lead is also provided and conveniently located above the steering wheel. A large float feed carbureter supplies the cylinders through an ample three-way induction pipe. A branched exhaust pipe conveys the exhaust gases to a large cylindrical muffler placed at the rear of the car. The main vehicle frame is of ash, interlined with steel flitch plates reinforced at the corners by forged angle pieces elongated to form spring carrying horns.

When advancing the spark to increase the speed above that permitted by the governor the action of the latter mechanism is suppressed by means of a small foot pedal; thus, if pressure on the pedal is maintained the speed of the motor is entirely at the command of the operator through the medium of the hand-operated spark lever. The advantage of this arrange-

HERCULES RUNNING GEARS

FOR ELECTRIC AND GASOLINE VEHICLES

There are no weak spots in these gears. Their design is original and the construction is sound.



We also solicit orders for parts of these gears. Prices and particulars of construction sent on application.

THE AUTOMOBILE AND CYCLE PARTS COMPANY

SMITH STAMPINGS FACTORY

Milwaukee Wisconsin

Midgley Tubular Steel Wheels.

Artillery Pattern.

When in the market write the

Midgley Manufacturing Co.
Columbus, Ohio.

K. Franklin Peterson,
165 Lake Street, Chicago,
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Studebaker AUTOMOBILES

A MOTOR-VEHICLE WORTHY *of the* STUDEBAKER NAME

WE have not been indifferent to the introduction of the horseless carriage. Rather than push upon the market an imperfect and immature product, however, we have expended time and money in order to secure a type of automobile which would not discredit our standing in the vehicle world.

The Studebaker Electric Vehicle

is admirably simple in construction, safe, easy to operate and remarkably free from vibration and noise. It is not a racing machine, but a strongly built practical motor-vehicle for everyday service on country roads and city streets.

Extensive experiments and tests have convinced us that the electric motor, with the great improvements recently made in storage batteries, provides the most desirable equipment in every way. It is simplicity itself, clean, odorless, durable and sufficiently speedy for all practical purposes.

Now on exhibition at the following repositories. Descriptive booklet free.

STUDEBAKER BROS. MFG. CO.

NEW YORK CITY: Broadway and Prince St.
CHICAGO, ILL.: 378-388 Wabash Avenue.
KANSAS CITY, MO.: 810-814 Walnut St.
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DENVER, COLO.: Corner 15th and Blake Sts.
SALT LAKE CITY, UTAH: 157-159 State St.
PORTLAND, ORE.: 328-334 E. Morrison St.
DALLAS, TEX.: 194-196 Commerce St.

Local Agencies Everywhere.

FACTORY AND EXECUTIVE OFFICE: South Bend, Ind.

ment will be appreciated when driving through traffic, as the speed of the car may be reduced from maximum to well under 10 miles an hour without shifting the gears.

FRANKLIN CO. BUILDING NEW FACTORY.

Syracuse, N. Y., July 28.—The Franklin Mfg. Co. has under construction at its factory a large and high speed automobile for Alexander T. Brown, the president of the company. It is expected that the vehicle will be completed early in August and its cost will be approximately $5,000. The carriage is to be propelled by gasoline and will be equipped with a 40 horsepower four-cylinder engine. It is to be handsomely finished with a tonneau body, seating six people. All complete it will weigh 2,500 pounds.

A representative of the Franklin company announced that Robert J. Reidpath, an architectural engineer of Buffalo, had nearly completed plans for the new factory building to be erected in South Geddes street this summer. The company has engaged Architect Gordon A. Wright, of this city, to superintend the construction of the building, ground for which will be broken within two or three weeks. It will be four stories high and 52x110 feet in dimensions, occupying a part of the site of 2½ acres. It will be a modern factory building and will have a separate power house. It is the plan of the company to use electricity for power, generating its own electricity. The company expects to take possession of the new plant in the early fall.

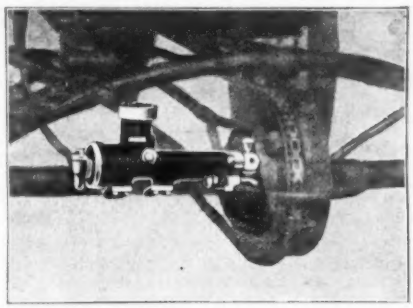
BIG COMPANY'S USE OF EXIDE BATTERIES.

The Exide battery, manufactured by the Electric Storage Battery Co., of Philadelphia, combines the three necessary features of a commercially successful automobile battery, high capacity, long life and freedom from structural weakness. While batteries have been constructed and placed on the market attaining a phenomenally high mileage capacity that result does not at all imply a commercially successful battery, as the increase in the cost of maintenance far outweighs the advantages thus gained. The Exide battery is the result of a most careful series of tests made by the Electric Storage Battery Co. in the operation of vehicles by the New York Transportation Co., which company, after a year or more of continuous service with seventy-five sets of Exide accumulators, decided that these batteries provide a sufficient mileage capacity for all classes of service together with a cost of operation, including maintenance, which is reasonable. Runs of over 60 miles have been frequently made and a conservative estimate of the life of these cells is placed at 6,000 miles. An interesting statement is made by an engineer who has had under his personal observation hundreds of electrical vehicles in daily service to the effect that the Exide battery is "better adapted to its work than some other portions of the equipment and in point of maintenance cost is a smaller factor in the total expense than are, for instance, the rubber tires on the vehicle it runs."

REASON AUTOMATIC AIR PUMP.

The device manufactured by the Reason company, now of Detroit, is entirely automatic in its operation. It can be set by a simple adjustment to automatically lock and unlock on any predetermined pressures from 5 to 80 pounds and the variation between the locking and unlocking points can be regulated at from 5 to 20 pounds, thus maintaining a reliable uniform pressure between the two points of adjustment. The capacity of the pump is from 40 to 50 pounds of air in from 3 to 5 minutes, the pump being in operation only a small portion of the time the vehicle is running to keep up the desired pressure.

The new model pump is attached to the rear axle of the vehicle with clips, as shown in cut, and is operated by a cam disc, the face of which is bolted to the sprocket, which makes a suitable cover for the compensating gear. It can be attached in a few minutes, is positive in its operation and requires practically no attention except occasional oiling, all wearing parts being protected from dirt or dust. A simple auxiliary device is provided whereby the pump can be stopped



Reason Air Pump, Attached.

and started from the seat. The pump can also be used to inflate tires. It weighs about 7 pounds, is neat, compact and occupies small space. All parts are interchangeable. The adoption of this pump means a saving of fuel, uniform steam pressure, convenience and comfort to the driver.

The "Reason Jr." is a pump similar to the one above described, but without the automatic features, being started and stopped by the driver from the seat. Both pumps are made by the Reason Automatic Air Pump Co., Detroit.

NOTES OF THE CLEVELAND TRADE.

Cleveland, Ohio, July 29.—The other day the writer took a 15-mile spin with B. T. Quilling, of the Quilling Brothers. This firm has disposed of about twenty-five Genevas this season. This is a satisfactory showing, in view of the fact that the White company has a store almost next door and has the advantage of two years' prestige with an A No. 1 machine, not to mention the location of its factory in this city. Never once in that 15-mile run over hilly country did the steam gauge drop below 200 pounds and frequently it was necessary to turn down the fire to prevent the generation of too much steam. Long hills caused no apparent drop in the steam dial, although they were taken at full speed. The water supply in the Geneva is rendered entirely automatic through the use of a duplicate set of pumps, and there is never necessity for the tiresome exercise of working a hand pump. The entire absence of vibration and the high speed which can be maintained through the unusual steam reserve factor makes the Geneva a steamer well calculated to make the gasoline machines look to their laurels. Mr. Quilling, who is a stockholder of the Geneva company, reports that the factory is securing considerably more business than it can attend to, and that a number of orders have been received from foreign countries. The variety of types which this company offers is equalled by few makers and the well-known reputation which President Carter has enjoyed in the old bicycle days insures thorough practibility and the best of quality in the new line. Quilling Brothers will probably handle the Rambler gasoline

runabout for the balance of the season, that line having been taken from another concern.

Booth & Manley, agents for the Toledo steam vehicle, have taken up the big touring car which is just being completed and placed on the market by the International company. Booth & Manley are also meeting with fair success in introducing the Toledo motor cycle, having sold several.

The Hoffman Automobile Mfg. Co. is out with the announcement that it is ready to make deliveries of its steam carriage. It is equipped with a 12-horse power engine and steam is furnished by a new flash boiler of Mr. Hoffman's own design.

The Merriam-Abbott Co., manufacturers of charging outfits for electric batteries, is meeting with excellent success in introducing its sets. It has been found that the outfits are particularly adapted to small electric lighting plants and the firm is branching into this line somewhat.

LATE ISSUES FROM THE PATENT OFFICE.

No. 794,589, to Charles E. Splitdorf, of New York, covers a casing for spark coils. The distinctive feature of this casing is that it is formed in a series of layers of rubber or other absolute non-conductor. This part of the casing is in one piece encircling the coil. The covering of the ends is of similar layers, through which pass the terminal wires. After assembling the end coverings are joined to the tubular casing and the whole is placed within an outer casing, which may be a non-conductor in a lesser degree, its object being to protect the inner casing from accidental injury.

No. 794,676, to Ferdinand Charron and Leonce Girardot, of Paris, France, covers a metallic body or a gasoline tank forming a part of the body of an automobile. This tank is formed of two pieces, one of which is in the form of a cross and provides the bottom, sides and ends of the tank. The part forming the ends and that forming one of the sides extend above the top of the tank and form the sides and back of the seat. The second piece forms the top of the tank and bottom of the seat. It is stated that the object of this device is to simplify construction, and the inventors might go a step further by carrying that wing forming the front of the tank backward at an angle of 90 degrees, thus forming the top of the tank and making the entire device of one piece. This would, however, require a sheet of considerable dimensions.

No. 704,809, to Alvaro S. Krotz, of Springfield, Ohio, covers a running gear for electric vehicles. The characteristic of this device is that the motor is carried on one of the reach rods adjacent to the rear axle, thus putting the motor at one side, instead of the center of the vehicle. The differential gear is at the side of the vehicle near the hub and at the other side a brake drum is secured to the wheel.

No. 704,860, to Samuel S. Conant, of Edgerton, Ohio, covers a freaky running gear in which the wheels are secured to vertically movable stub axles, so that they are free to move vertically in relation to the running gear. All four wheels are pivoted for horizontal movement and all four are driven by a system of gears which are adapted to make allowance for the vertical movement of the wheels.

No. 704,911, to Ransom E. Olds, of Detroit, Mich., covers the friction clutch used in connection with the transmission gear of the Oldsmobile. The distinctive features of this clutch are that it is applied laterally instead of radially and that the friction blocks or shoes, being on springs, cannot be set suddenly with sufficient force to strip the gears. The hub of the clutch member, secured to the driven member, is provided with a series of radial arms, which are formed of flat spring metal arranged in substantially the plane of rotation. The width of these springs is sufficient to make them comparatively rigid in resisting strains in the direction of rotation, while they are sufficiently thin to permit of freely flexing transversely to the plane of rotation. At the outer ends of the arms are secured the friction blocks, which bear against the face of a disc which is driven by the motor. The device for applying the blocks comprises a series of bell cranks adapted to be forced against the spring arms by a cone longitudinally slidable on the shaft.

EXPORTS OF AUTOMOBILES AND CYCLES.

Washington, D. C.—July 23.—The following is a list of exports of bicycles, automobiles and parts for the week just ended from the port of New York:

Argentine Republic—Bicycles, one case, $32.
Antwerp—Bicycles and material, four packages, $120.
Amsterdam—Bicycle material, one package, $10.
Azores—Bicycles and material, two packages, $25.
Berlin—Bicycle material, one package, $20.
Batoom.—Bicycles, three packages, $80.
British West Indies—Bicycles and material, eighteen packages, $464.
British East Indies—Bicycles and material, twenty-seven packages, $602.
British Possessions Africa—Bicycles, 208 packages, $6,168; velocipedes, five packages, $115.
Bristol—Bicycle material, one package, $30.
British Australia—Bicycles and material, 104 packages, $3,887; velocipedes, seven cases, $115.
Bremen—Bicycles, one package, $12; bicycles, three cases, $75.
Cuba—Bicycle material, two cases, $150.
Copenhagen—Bicycle material, seventy packages, $2,166; bicycles, fourteen cases, $310.
China—Bicycles and parts, thirty-three packages, $575.
Central America—Bicycles, three crates, $20.
Christiansund—Bicycles, one case, $15.
Gothenburg—Bicycles, four crates, $100.
Glasgow—Bicycles, seven packages, $205.
Helsinfors—Bicycle material, one case, $54; bicycles, five packages, $220.
Hong Kong—Bicycles and material, one package, $50.
Hamburg—Bicycles, fifteen packages, $398; bicycle material, twenty-nine packages, $1,308; bicycle material, one case, $80.
Havre—Bicycle material, thirty-six packages, $923; bicycles, twenty-five crates, $275.
Japan—Bicycles and material, fifty-two cases, $1,045; velocipedes, six cases, $195.
Konegsberg—Bicycles, one case, $18.
London—Bicycles, two packages, $55; bicycle material, thirty-five cases, $2,225.
Liverpool—Bicycles, forty-one cases, $1,033; bicycle material, five cases, $151.
Mexico—Bicycle material, one case, $25.
Newfoundland—Bicycle and material, one case, $78.
Philippine Island—Bicycle material, one case, $50.
Rome—Bicycles, two packages, $75.
Rotterdam—Bicycle material, sixty-three cases, $1,168.
Southampton—Bicycle material, fifty packages, $879.
Stockholm—Bicycle material, one package, $65.
U. S. Columbia—Bicycle material, three packages, $18; velocipedes, four packages, $21.
Uruquay—Bicycles, one package, $42.
Venezuela—Velocipedes, two cases, $16.
Antwerp—Auto vehicles, one package, $900.
Bibao—Auto vehicles and parts, one package, $175.
Cuba—Auto vehicles, one crate, $750.
Copenhagen—Auto vehicles and parts, two packages, $638.
Gothenburg—Auto velocipedes, one case, $466.
Hamburg—Auto vehicle, one, $2,000.
Havre—Motor vehicles, seven packages, $6,400.
London—Motor vehicles, twenty cases, $16,000.
Odessa—Auto vehicle, two, $875.

ELECTRIC VEHICLE CO.'S CATALOGUE.

The new twenty-four page catalogue of Columbia automobiles, now being distributed, is the largest and most comprehensive publication ever issued by the Electric Vehicle Co. Seventeen models of Columbia vehicles are illustrated and described at length, including the company's various styles of runabouts, victorias, surreys, cabriolets, tonneaus, broughams, ambulances, delivery wagons, etc. In an introductory chapter it is stated that the operation of an electric automobile forcibly illustrates the success of inventive genius

HIGH DUTY STEEL BALLS

ACCURATE TO 1-10000 OF AN INCH

TRADE MARK THE NEW PROCESS STEEL BALLS

EXACTLY SUITED FOR AUTOMOBILES

WE MAKE OVER 500,000 BALLS EACH DAY

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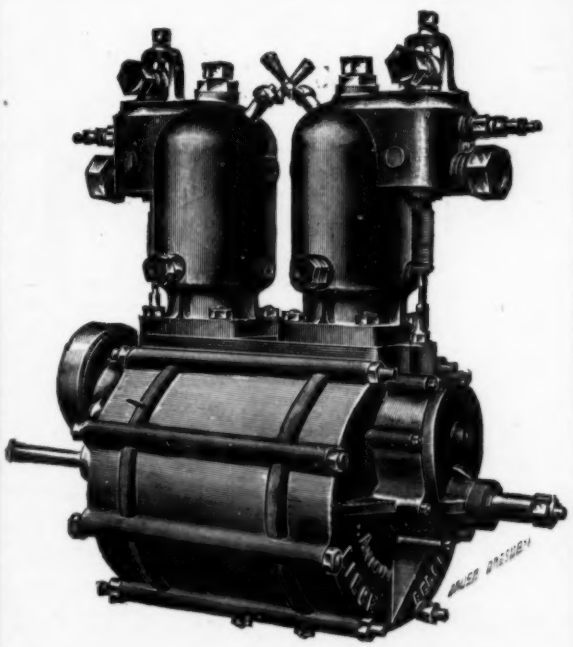
BALL AND PEDAL FACTORY
Cleveland - - Ohio



KELECOM MOTORS
FOR IMMEDIATE DELIVERY

Sizes: 1¾ h. p., 5 h. p., 7 h. p., 9 h. p. and 11 h. p.

The Kelecom has been proven in American and European contests to be one of the most reliable and economical engines on the market. American builders who are using Kelecom Motors are all behind in their orders. The 1½ h. p. Bicycle Motor is without an equal. Send for descriptive matter.

A. H. FUNKE,

98 Duane Street,
NEW YORK.

SECOND
EDMOND, - - 16h., 12m., 30s.

THIRD
BARAS, - - - 17h., 17m., 52s.

FIFTH
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MARCELIN, - 17h., 45m., 18s.

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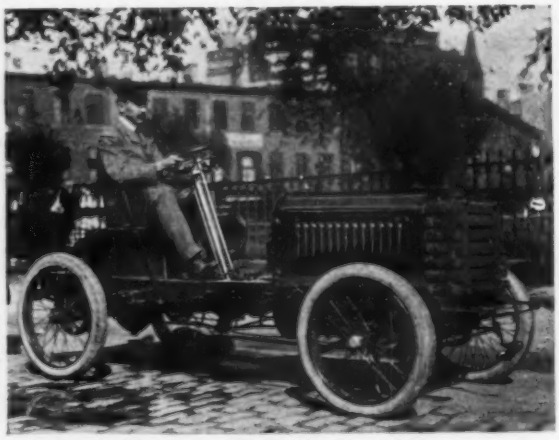
NOTWITHSTANDING

The long distance, and, above all, the great difficulties of bad mountain roads in Switzerland and Austria, THE LIGHT

DARRACQ

Vehicles Have Figured Brilliantly

In the Paris-Vienna Race



THIS 36 HORSEPOWER RACER FOR SALE.

Taking FIRST PLACES and establishing records as they usually do; but most noteworthy is the fact that in the General Classification the light Darracq vehicles are third and fifth,

Beating Twenty Heavy Racing Machines. . . .

Proving not only that the Darracqs are the fastest, but are also superior to the Mastodon Racers in Endurance, Reliability and Regularity.

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NEW YORK

F. A. LaROCHE, Gen. Sales Mgr.

ALSO IN THE VOITURETTE CLASS...

FIRST

GUILLAUME, 18h., 54m., 50s.

in transforming forces which exist in nature into practically applied mechanical power. It is shown how through the successive agencies of engine, dynamo and storage battery, potential energy, stored in coal, is converted into active force and its application to the driving wheels of the vehicle reduced to extreme simplicity. The catalogue deals chiefly with the company's electric vehicles, although it is noted in the preface that it is by no means neglecting the important field of the gasoline vehicle and is devoting constant attention to developing new models of the gasoline type. It is claimed that, at this stage of the art of automobile making, the electric is the only practical machine for many pleasure drivers, that it is best for ordinary runabout service, for the requirements of the physician, for various business uses and for all other purposes where it is undesirable that the operator attend to the generation of power and the working of the considerable number of mechanical parts.

Within the last year the field of the electric vehicle has been greatly broadened by the continued improvements in long-distance batteries, by the development of the automobile "stable" and by the increased availability of private charging plants. To meet the increased demand for electric automobiles due to these changed conditions, the company has extended its factory facilities from time to time during the last twelve months and steadily maintained each department in line for every latest development of mechanical and electrical knowledge.

Finely executed half-tone cuts are shown of each of the various models and supplemented by ample descriptive matter. The last two pages deal with the care of electric automobiles and present the general directions for their care and maintenance.

The catalogue is handsomely bound in dark green covers. The front cover is printed in gold and presents the well-known trade mark of the company and the words "Columbia Automobiles." It may be had on application by mail to the Electric Vehicle Co., Hartford.

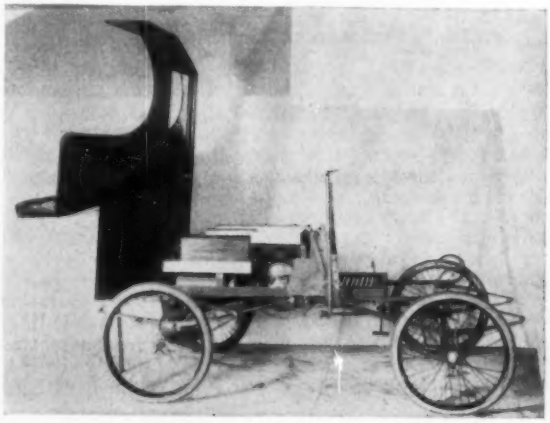
FISCHER CAPTURES BUSINESS IN LONDON.

S. M. Fischer, formerly of Chicago, at present in London, is said to have interested some of the London bus companies in his vehicle and to have made arrangements to replace a large number of them. Mr. Fischer was formerly of the Fischer Equipment Co., in which Mr. Woods, afterward founder of the Woods Motor Vehicle Co., was also interested. It is reported that last week Mr. Fischer's 18-year-old son operated one of the new buses so satisfactorily as to convince Londoners of its reliability and superiority over the horse-drawn vehicles.

MILWAUKEE IDEAL GASOLINE RUNABOUT.

The B. & P. Co., of Milwaukee, has completed a number of runabouts which contain features found in few machines of its class. Strength has not been sacrificed for lightness, the machine weighing 1,250 pounds. The axles are heavier than are ordinarily found in machines of its class, the idea in making them so being to provide against sagging or breakage. The springs are long and designed to absorb vibration to the greatest possible extent, producing an easy riding machine in which there is flexibility in every joint. The mechanism is mounted on an angle iron frame. The engine is the center of interest, being small, considering the weight carried, yet sufficiently powerful to propel the vehicle 22 to 25 miles an hour. It is 4½ by 6 inches, has mechanically operated inlet and exhaust valves, each of which are large for an engine of the size, thus allowing free passage of gas at all speeds, both in and out of the cylinder. The intake valves have flat surfaces and seats while the exhaust valves are of the usual pattern.

Each of the valves is carried in a separate casing, the casings ground to fit the chambers in the cylinder heads provided for them and each is easily removed should occasion require. The cranks are balanced so that there is practically no vibration, while the flywheel is heavy, weighing about 130 pounds. The transmission gear is mounted on the engine shaft and is similar to many used on light vehicles, except that it is heavier throughout, has larger gears and more



The Milwaukee Ideal, with Body Raised.

substantial friction bands, the latter being made of brass and so hung on the supporting frame that when the clutch is released the bands are held 1-16 of an inch from the clutch surface, relieving all friction. The inner surface of the bands has a specially prepared frictional surface so that with ordinary pressure the clutch is thrown into operation.

The control is entirely by one lever and the method of obtaining it is somewhat unusual, as well as simple and substantial. A lever is mounted in front of each friction surface of the transmission clutch, one end of each lever being suitably fastened to the friction bands and also pivoted on a suitable brace a short distance from the clutch ends. The forward ends of the levers project to the cross bar of the frame upon which the forward end of the crank case is carried, and are so arranged that there is practically no side play, although each is free to move up or down. To secure the tightening of the different parts of the clutch a sliding bar is arranged to operate under the forward ends of the levers above referred to, the lever sliding bar having a flat under side to form a secure and smooth bearing surface and on the top side, it being stood on edge, there is a rise of about ¼ inch extending along the bar about 1½ inches. As the bar is moved from one side to the other by the operating lever the raised portion passes first under the slow speed clutch lever, then from that to and under the one operating the high speed or directly connected clutch, which locks the gear to the engine shaft. From that position it is reversed in the same way, until, after passing through the slow speed, the gear is thrown out of action and then the reverse is thrown in. The reverse is operated during the backward motion of the controlling lever and the forward speeds are controlled by moving the lever forward of the free position.

There is not a piece of flimsy construction in the whole machine. It is fitted with radiating coils on the front, below the dash, and carries sufficient water for 100 miles. Metallic bodies have been used on all the

machines built up to date and these are so fitted to the framework that, by loosening two bolts under the forward end of the body, it may be raised, as shown in the illustration, so that every part of the mechanism is get-at-able. That feature will be appreciated by anyone who has had occasion to get at the machinery and should be generally adopted.

J. H. Douseman, late manager of the Milwaukee Automobile Co., now located at Fourteenth street and Michigan avenue, Chicago, is the local agent and has a machine constantly in use. It has been run many hundreds of miles already without repairs. The machine lists at $850.

Auto & Cycle Parts Co. Changes Name.

Cleveland, Ohio, July 29.—The Automobile & Cycle Parts Co. announces that after August 1 its title will be the Federal Mfg. Co. The personnel of the management continues as heretofore. The reason for this change is the fact that automobile and cycle parts have long since ceased to be the heaviest end of its business, the lines now being produced at the several plants being extremely diversified. The various stamping plants will in the future be devoted very larged to stamped productions of every variety, especially those used in electrical work; hence the desirability of a more comprehensive title. However, this should not be taken to indicate that the automobile lines are to be dropped, or even slighted, for, as a matter of fact, new goods in this line will shortly be announced and automobile parts of all kinds will be pushed as never before.

Howard System of Vaporization.

J. F. Hathaway, of 31 Chester street, West Somerville, Mass., is making a device called the Howard system, to do away with torches and vaporizer on steam carriages. It consists of a small copper reservoir holding about a quart. This is entirely separate from other gasoline connections, and is not under pressure. Under the seat, with a handle projecting through the side of the carriage near the bypass, is a small air pump. Running from the pump under the carriage to the burner is a small pipe. This is all of the apparatus. When steam is required a match is placed in the peep hole and a few strokes made on the pump. Instantly a hot, smokeless, blue flame is produced in the firebox. The pump is worked for about a minute and then the main fire can be turned on. The device is guaranteed and sells at a moderate price.

Mr. Hathaway is also the builder of a detachable extension front for automobiles, by the use of which a single-seated carriage can be turned into a surrey. It consists of a footboard and dash, which is attached to the front of the vehicle.

The Universally Popular Olds.

The well-nigh universal popularity of the Oldsmobile runabout illustrates most forcibly how quickly people appreciate practical merit. The Oldsmobile may be said to be in a class by itself. It has none of the special attributes which bring it into the notice of the daily newspapers, but it perfectly answers the widespread call for a carriage which immediately takes the place of the horse and buggy at a minimum of cost and trouble and requiring no mechanical study on the part of the operator. The Oldsmobile is the common sight not only on the driveways, parks and streets of the large cities, but on almost every country road. "Seen" is the correct expression, because, unlike the largest type of vehicle, it is almost noiseless, and this feature, as well as other good points, recommend it to prospective buyers. The Olds company, which operates gigantic plants at Detroit and Lansing, Mich., is always pleased to supply interesting literature descriptive of its vehicles and their performances.

Rambler Described in Useful Catalogue.

One of the most interesting booklets on automobiles and one containing many pertinent pointers regarding talking points of an autobomile is that just issued by Thomas B. Jeffery & Co., Kenosha, Wis., makers of the well-known Rambler. The booklet is tastily arranged, goes into details regarding the construction and operation of the machine and shows numerous illustrations of the factory in which they are made. One in particular, illustrating the automatic machine department, is highly interesting, showing the marvelous development made in the production of interchangeable parts, a feature that will be appreciated where new parts are necessary. As an argument in favor of automobiles driven by hydro-carbon motive power the booklet is a shining example and should be in the hands of every one desiring information of value concerning automobiles in general and the Rambler in particular.

Elmore Proves Good Mud Horse.

Covered with dust and dirt, browned by sun and wind, almost indistinguishable in individuality, F. L. Wachtel and Frank Newcomer stepped from a mud-plastered automobile in front of the Wachtell store, Muncie, Ind., at 10 o'clock Tuesday night of last week after a 200-mile jaunt that had extended over the greater part of two days. The trip was made in an Elmore gasoline motor mobile, manufactured at Clyde, O., ten miles south of Sandusky. They left Clyde Monday morning and stayed over night at Bellefontaine. At 9:30 o'clock Tuesday morning they set out again for Muncie and reached here at 10 o'clock at night. The roads north of Bellefontaine were full of mud after the heavy rains through northern Ohio and the machine brought home a great part of it. The only accident of the trip was a blown-out tire between Tiffin and Carey. No remarkable time was made on the run, but it was a noteworthy jaunt for such a light machine on its first trip.—Muncie (Ind.) Morning Star.

Good Work of Kellecom Motors.

In the recent Paris-Vienna race Kellecom motors were prominent in effective work. These motors are imported to America by A. H. Funke, of 98 Duane street, New York, sole American agent. Mr. Funke, whose establishment was recently burnt out, has, phœnix-like, arisen from the ashes and has now in stock a full line of Kellecom motors, together with one of the most complete lines of acetylene headlights made in this country. Mr. Funke is showing Kellecom motors in the following sizes: 1¾ horsepower, air cooled; 5 horsepower, 7 horsepower, 9 horsepower and 11 horsepower, the latter double cylinder engines. In the last Long Island endurance contest a vehicle weighing 822 pounds and carrying two passengers, fitted with the Kellecom motor, went through the 100 miles without a single stop with the remarkably low consumption of 3 1-3 gallons of gasoline. Mr. Funke has now in stock all the motors in the above sizes and is ready to make immediate delivery.

First from the American Factory.

New York, July 26.—The first of the American Charron-Girardot-Voigt cars, a product of the factory at Rome, N. Y., is expected at Smith & Mabley's this week.

The Crestmobile made by the Crest Mfg. Co., of Cambridgeport, Mass., is seen everywhere around the city of Boston. Several owners of these machines, who were seen by a MOTOR AGE man recently, expressed the utmost enthusiasm over their vehicles.

STANDARD

SINGLE TUBE TIRES

DOUBLE TUBE TIRES

"Born for Success with those qualities which win"

Hartford Tires AND Dunlop Tires

Have Stood Pre-eminently Foremost Since the Introduction of Pneumatic Tires

Few devices have been the subject of a greater inventive faculty or more persistent and successful exploitation, and few have reached such a high state of development.

They Never Vary in Quality or Workmanship Because They Cannot Be Made Better or of Better Materials

If the BEST is none too good for you, it will pay you to adopt these widely and most favorably known tires. Every user is bound to be satisfied with them.

True Economy Represents Buying the Best Wherever You Can Find It

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for very heavy vehicles. Particularly adapted for use where proper strength is required and length of service is guaranteed.

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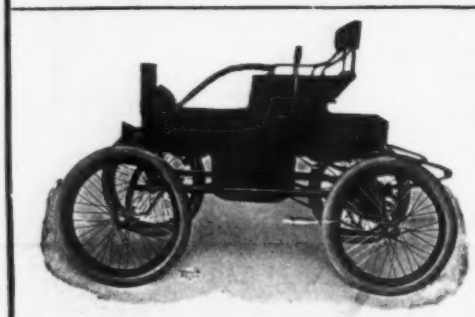

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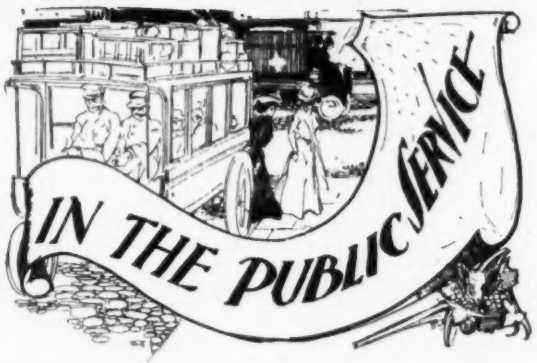

SUCCESSFUL STAGE LINE IN PORTO RICO.

Reference has been made more than once in these columns to a stage line between San Juan and Ponce, Porto Rico. This line is now in full operation by the Automobile Transportation Co., of Porto Rico, which was organized on March 1, with capital stock of $25,000. It owns seven Locomobiles, each carrying four people, and makes the trip, a distance of 85 miles, daily. one carriage starting from each end. They are timed so that they meet at Cayey, about half way, where a stop is made for lunch. The full journey is made in about 9 hours.

The road is the old Spanish military road and of the finest description. At one point, the famous Aibonito pass, the route is 2,800 feet above sea level. To get to the top of this mountain from Ponce the vehicles climb a grade of from 7 to 12 per cent for 3½ miles. Leaving Caguas the route leads up a hill, 8 miles long, with a grade of from 5 to 7 per cent. The remainder of the line is over a rolling country, up and down hill, there being only about 20 miles of really level roads.

The Locomobiles have given satisfaction; the principal trouble has been caused by the tires. The great heat causes the outer casing to leave the fabric and peel off, so that the tires wear quickly. The company expects to receive six new machines of the same make in a few weeks. Its directors are J. D. H. Luce, president; P. G. Mumford, secretary and treasurer; E. F. Gates, superintendent, and Robert Giles and W. Dooley, directors.

AIMS TO CONTROL THREE COUNTY LINES.

With headquarters in the town of Virginia and with a desire to control the automobile stage line industry of St. Louis county, Minnesota, a company will be organized in a few days. The prime mover in the enterprise is W. W. Freeman, of Virginia, who will probably be secretary and one of the directors of the company. For the purpose of starting the business Mr. Freeman purchased a Locomobile surrey and the first trips will be made between Virginia and Eveleth, 4½ miles, the charge for the service being 50 cents.

As soon as the organization has been completed the company will be in the market for other machines. The gentlemen interested favor gasoline vehicles, believing that they will prove more satisfactory on heavy grades and in cold weather. They have no complaint to make, however, about the operation of the machine it at present owns.

The company hopes to be able to maintain control of the business in its county and may undertake to cover Lake and Itasca counties as well, and its promoters have decided not to purchase any machines unless they can get the exclusive right for their own county. Under such conditions they are willing to buy several heavy, covered vehicles. "We are going into this on a large scale," says Mr. Freeman, "and will establish lines wherever there is any likelihood of their paying, and in any field in this region where anybody would be likely to put a machine we will be found."

At its meeting at Atlantic City last week the League of American Wheelmen decided that its financial condition was not such as to warrant participation in the movement for a road between New York and Chicago.

Demand for Trucks for Service in India.

There is a great demand for automobile trucks and carriers in Natal, says a French trade paper. Merchandise carriers, either alcohol or petroleum, able to carry 2, 2½ or 3 tons and weighing over 3½ tons, with 10 to 14 horsepower motors, will find a ready sale. The local regulations stipulate that the motor must make little noise and that the escape of steam or smoke must be very moderate. The climate of Durban being very wet, leather belts for transmission are not practical. The mechanism must be simple and, as the roads are dusty, the main parts of the machine must be well under cover from the dust.

Dennis McConnell has organized what will be known as the Chillicothe and Bainbridge Transfer, with headquarters at Chillicothe, Ohio. He at present owns three vehicles, each with a carrying capacity of fourteen passengers, and expects to commence operations on the first day of September. The vehicles will cover a distance each way of 40 miles, the fare being 3 cents per mile.

NEWBURYPORT, MASS.—An automobile line from this city to Boston, passing through Haverhill, is an assured thing. Already a corporation, including several local people, has been formed under the laws of Maine, with a capital of $100,000. This company will be known as the Newburyport, Lowell & Boston Palace Coach Co. H. H. Hobbs, of this city, is president, and George E. Kerrigan, of Haverhill, is vice president. Charles C. Smith, of Kittery, Me., is the corporation lawyer. The company will not begin its trips until next March, as it cannot secure its coaches before that time. The route will be from Newburyport to Lowell, passing through Haverhill and Lawrence and thence to Boston via Lowell and Lexington. It is expected that hourly trips will be made. Orders for large, commodious automobile coaches of the latest pattern will soon be sent in. President Hobbs stated that his company expected to make hourly trips from either end of the line. The main office will be in Haverhill.

MANISTEE, MICH.—A new departure in inspection cars is being given public trial on the Manistee & Grand Rapids Railroad. The car is nearly 6 feet in length and derives its motive power from two small gasoline engines, one on each side of the car. The power developed is not great, being equal to about 2 horse, but the speed ranges from 25 to 30 miles an hour. The car weighs about 700 pounds and is fitted with springs, guards and upholstered seats in such manner that riding is made comfortable. Five passengers can be carried. It is an economical machine, using less than 4 gallons of gasoline on a 100-mile run.

GREEN LAKE, WIS.—A line of passenger automobiles is to be established between Green Lake and Princeton and between Green Lake and Ripon. Each automobile will carry from twelve to twenty passengers and will be built so as to protect them from rain or other discomforts.

MONTREAL, P. Q.—The new electro-gasoline motor car built by the Canadian Pacific Railway Co. for the use of tourists in the Banff district, left for its future sphere of usefulness. Since the successful test of the motor, made a short time ago, the car has been completely encircled by a protection railing, to obviate any fear of an accident to passengers. The vehicle a few days since made a speed of 30 miles an hour. The brake affixed to the car is capable of stopping it within a few yards. An electric searchlight, worked from the motor, has also been added.

MADISON, WIS.—M. H. Welton left for Eureka, S. D., with a party of gentlemen from Richland Center, to whom he will introduce the advantages which Emmons county, North Dakota, is said to possess over other parts of the earth and the northwest in particular. A feature of this comparatively new country is the fact that three railroads, the St. Paul, Northern Pacific and the Soo, are building lines through that domain as rapidly as men can lay the tracks. Prospective landseekers are met at Eureka and taken over into the promised land in an automobile, rather a different method from the good old days of the primitive prairie schooner.

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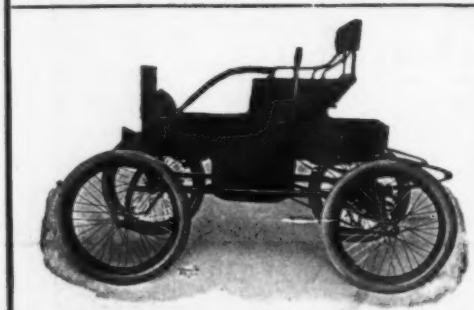

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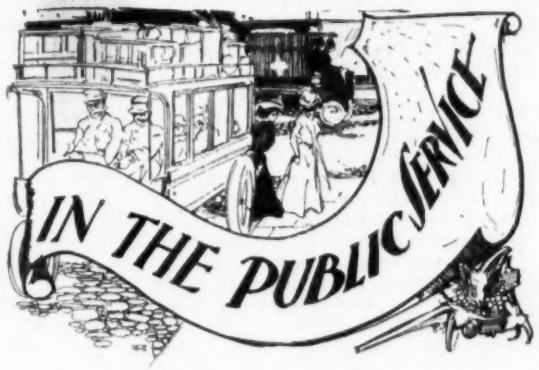

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AIMS TO CONTROL THREE COUNTY LINES.

With headquarters in the town of Virginia and with a desire to control the automobile stage line industry of St. Louis county, Minnesota, a company will be organized in a few days. The prime mover in the enterprise is W. W. Freeman, of Virginia, who will probably be secretary and one of the directors of the company. For the purpose of starting the business Mr. Freeman purchased a Locomobile surrey and the first trips will be made between Virginia and Eveleth, 4½ miles, the charge for the service being 50 cents.

As soon as the organization has been completed the company will be in the market for other machines. The gentlemen interested favor gasoline vehicles, believing that they will prove more satisfactory on heavy grades and in cold weather. They have no complaint to make, however, about the operation of the machine it at present owns.

The company hopes to be able to maintain control of the business in its county and may undertake to cover Lake and Itasca counties as well, and its promoters have decided not to purchase any machines unless they can get the exclusive right for their own county. Under such conditions they are willing to buy several heavy, covered vehicles. "We are going into this on a large scale," says Mr. Freeman, "and will establish lines wherever there is any likelihood of their paying, and in any field in this region where anybody would be likely to put a machine we will be found."

At its meeting at Atlantic City last week the League of American Wheelmen decided that its financial condition was not such as to warrant participation in the movement for a road between New York and Chicago.

Demand for Trucks for Service in India.

There is a great demand for automobile trucks and carriers in Natal, says a French trade paper. Merchandise carriers, either alcohol or petroleum, able to carry 2, 2½ or 3 tons and weighing over 3½ tons, with 10 to 14 horsepower motors, will find a ready sale. The local regulations stipulate that the motor must make little noise and that the escape of steam or smoke must be very moderate. The climate of Durban being very wet, leather belts for transmission are not practical. The mechanism must be simple and, as the roads are dusty, the main parts of the machine must be well under cover from the dust.

Dennis McConnell has organized what will be known as the Chillicothe and Bainbridge Transfer, with headquarters at Chillicothe, Ohio. He at present owns three vehicles, each with a carrying capacity of fourteen passengers, and expects to commence operations on the first day of September. The vehicles will cover a distance each way of 40 miles, the fare being 3 cents per mile.

NEWBURYPORT, MASS.—An automobile line from this city to Boston, passing through Haverhill, is an assured thing. Already a corporation, including several local people, has been formed under the laws of Maine, with a capital of $100,000. This company will be known as the Newburyport, Lowell & Boston Palace Coach Co. H. H. Hobbs, of this city, is president, and George E. Kerrigan, of Haverhill, is vice president. Charles C. Smith, of Kittery, Me., is the corporation lawyer. The company will not begin its trips until next March, as it cannot secure its coaches before that time. The route will be from Newburyport to Lowell, passing through Haverhill and Lawrence and thence to Boston via Lowell and Lexington. It is expected that hourly trips will be made. Orders for large, commodious automobile coaches of the latest pattern will soon be sent in. President Hobbs stated that his company expected to make hourly trips from either end of the line. The main office will be in Haverhill.

MANISTEE, MICH.—A new departure in inspection cars is being given public trial on the Manistee & Grand Rapids Railroad. The car is nearly 6 feet in length and derives its motive power from two small gasoline engines, one on each side of the car. The power developed is not great, being equal to about 2 horse, but the speed ranges from 25 to 30 miles an hour. The car weighs about 700 pounds and is fitted with springs, guards and upholstered seats in such manner that riding is made comfortable. Five passengers can be carried. It is an economical machine, using less than 4 gallons of gasoline on a 100-mile run.

GREEN LAKE, WIS.—A line of passenger automobiles is to be established between Green Lake and Princeton and between Green Lake and Ripon. Each automobile will carry from twelve to twenty passengers and will be built so as to protect them from rain or other discomforts.

MONTREAL, P. Q.—The new electro-gasoline motor car built by the Canadian Pacific Railway Co. for the use of tourists in the Banff district, left for its future sphere of usefulness. Since the successful test of the motor, made a short time ago, the car has been completely encircled by a protection railing, to obviate any fear of an accident to passengers. The vehicle a few days since made a speed of 30 miles an hour. The brake affixed to the car is capable of stopping it within a few yards. An electric searchlight, worked from the motor, has also been added.

MADISON, WIS.—M. H. Welton left for Eureka, S. D., with a party of gentlemen from Richland Center, to whom he will introduce the advantages which Emmons county, North Dakota, is said to possess over other parts of the earth and the northwest in particular. A feature of this comparatively new country is the fact that three railroads, the St. Paul, Northern Pacific and the Soo, are building lines through that domain as rapidly as men can lay the tracks. Prospective landseekers are met at Eureka and taken over into the promised land in an automobile, rather a different method from the good old days of the primitive prairie schooner.

Automatic Regulation of Motor Speeds

AUTOMATIC governing of the speed of gasoline motors is being given attention by many motor and motor vehicle manufacturers. It is of importance inasmuch as it tends to the more economical operation of motors and anything in that line should be considered of such value to the industry as to warrant its being worked and thoroughly demonstrated.

The most common, and perhaps the first form of regulation of motor speeds used is that of reducing the supply of air and vapor, thus allowing the cylinder to be but partially filled with explosive mixture. The volume of vapor allowed to pass under these conditions is not sufficient to generate the full power, as produced by combustion of the vapor of a full cylinder under compression, and even from this reduced power must be deducted the effect of the friction caused by the effort of the piston to draw a full charge through the reduced opening. Thus not only is the force of the explosion reduced owing to low compression, but by the piston's effort to fill the cylinder on the outward stroke. But despite its faults this method of governing is more economical than the next popular form—that of varying the speed by the ignition.

In stationary motors the regulation of speeds is accomplished by a governor, so set that when the fixed maximum speed of the motor is attained the mixture is cut off. The effect is similar to that above described. In the automobile motor, however, conditions are not favorable to the use of a governor of that class and in a majority of instances the timing of the ignition is used to vary the speed. Under this method the primary circuit breaker is attached to the motor in such a way that it can be moved forward or backward as required in order to produce the spark after compression has begun to lessen, at the highest point of compression or just before that point is reached. The first position named produces combustion under a gradually lessening pressure, hence reduces the power of that explosion. Ignition on the highest point of compression gives a far more powerful impulse, inasmuch as the same amount of vapor is exploded in a smaller compass. When ignition occurs just before the highest point of compression is reached the power is still greater because of the extremely high pressure obtained by compressing not only the original volume of vapor, but the heat generated by the early ignition as well. Care is necessary that the spark is not timed so far ahead as to cause the motor to kick back.

It must be understood that the time consumed in the passage of the piston from its early ignition position to the beginning of the downward or outward stroke is small, hence the effect of early combustion is not detrimental to the efficiency of that particular stroke when the greater force exerted during the completion of the stroke is considered. The timing of ignition too early, especially when the motor is running at slow speed, is liable to cause what is termed a back explosion; that is to be avoided.

It is well understood that while the speed of the motor may be governed by the ignition, it is not the [illegible] result, for the cylinder takes in the full charge of vapor [illegible]

governing motor speeds which will accomplish greater economy and enhance the practical value of the hydrocarbon motor in all lines of usefulness is well worth attention.

In Chicago there are at least two prominent men working on this problem, but trying different methods. The Panhard type seems to be attractive but changes are being made so as to afford still greater control than is furnished by that particular type of governor. One that is now being produced and which has been tried with success consists of a centrifugal governor operating on one end of the cam shaft, and so constructed as to throw the cams completely out of gear, completely under the valves or in any intermediate position. The cams, instead of having surfaces parallel with the shaft, are cone shaped, thus affording a means to allow the valves to be opened to any extent, between the position at which the motor would run at its normal speed and that at which it would shut off entirely. The latter condition would arise only when the motor was suddenly relieved of a load and began to race. The governor would then cut out the cam and thus allow no exhaust to escape, so putting a heavy braking force on the motor when the exhaust stroke took place. This condition would maintain until the speed were so reduced that the governor contracted sufficiently to throw the cams partially under the valves, after which the cylinders would begin exhausting a certain amount of their contents and on the return strokes would take in sufficient fresh vapor to keep the motor running at reduced speed.

The normal speed of the motor is provided for by setting the cams so that when in full operation they will allow sufficient exhaust to escape that the cylinders can be again filled, or nearly so, with new mixture, but additional provision is made for the exhaust valves to be still further opened, so that the exhaust is entirely free from any restraint which would retard free action and power development. This feature is termed the accelerator, and is the only part of the mechanism that is not automatic. It is operated by hand or foot.

The other method which is being tried in Chicago is that of having the cams carried on a shaft that may be moved from one side to the other under the valves, the distance of the movement being such as to allow the cams to open and close the valves varying periods of time or not at all. The cams are so shaped that for a full exhaust they maintain the valves in open positions the full length of the return stroke while at other positions they vary the quantity of exhaust down to nothing. The latter condition, of course, would prevent further explosions taking place owing to the fact that the cylinders are filled with the gases of the last combustion and thus bring the motor down to the desired speed.

This mechanism is operated, so far, by hand and is yet to be proven in practice, although the man who has devoted time and money to its production is one who usually makes a success of what he undertakes in a mechanical way.

The exhaust governor offers a good field for advancement and will undoubtedly prove a prominent feature on machines equipped with hydro-carbon motors in the next few years. It is reasonable to believe that the best obtainable will be found on American machines, hence we look forward to the time when the exhaust governor will be provided on all vehicles in its highest mechanical and practical form.

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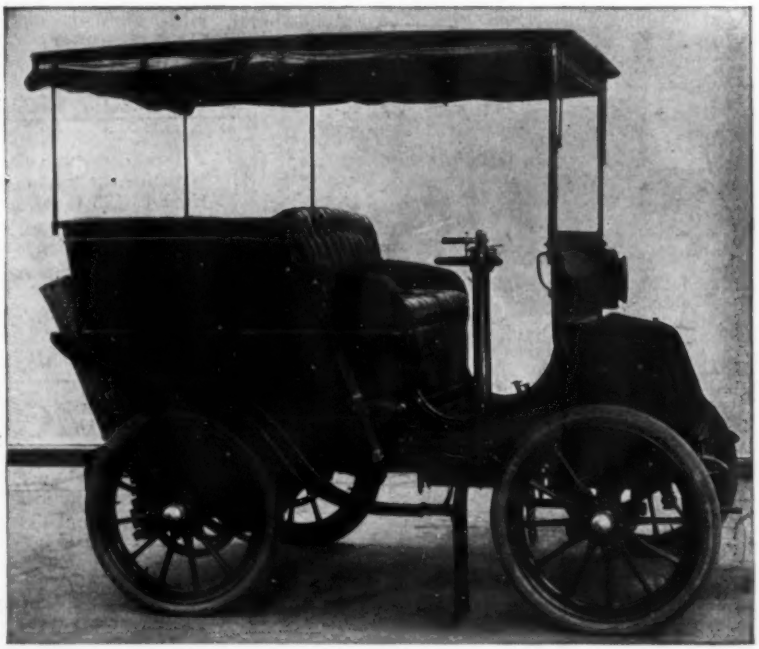

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It is well understood that while the speed of the motor may be governed by the ignition, it is not the most economical method of obtaining the desired result, for the cylinder takes in the full charge of vapor under any of these conditions, and is prepared to give forth its full power if allowed to do so. In cases where the combustion is started when the compression is lessening, the power derived is low, but the full charge is consumed. Thus it will be seen that any method of governing motor speeds which will accomplish greater economy and enhance the practical value of the hydrocarbon motor in all lines of usefulness is well worth attention.

In Chicago there are at least two prominent men working on this problem, but trying different methods. The Panhard type seems to be attractive but changes are being made so as to afford still greater control than is furnished by that particular type of governor. One that is now being produced and which has been tried with success consists of a centrifugal governor operating on one end of the cam shaft, and so constructed as to throw the cams completely out of gear, completely under the valves or in any intermediate position. The cams, instead of having surfaces parallel with the shaft, are cone shaped, thus affording a means to allow the valves to be opened to any extent, between the position at which the motor would run at its normal speed and that at which it would shut off entirely. The latter condition would arise only when the motor was suddenly relieved of a load and began to race. The governor would then cut out the cam and thus allow no exhaust to escape, so putting a heavy braking force on the motor when the exhaust stroke took place. This condition would maintain until the speed were so reduced that the governor contracted sufficiently to throw the cams partially under the valves, after which the cylinders would begin exhausting a certain amount of their contents and on the return strokes would take in sufficient fresh vapor to keep the motor running at reduced speed.

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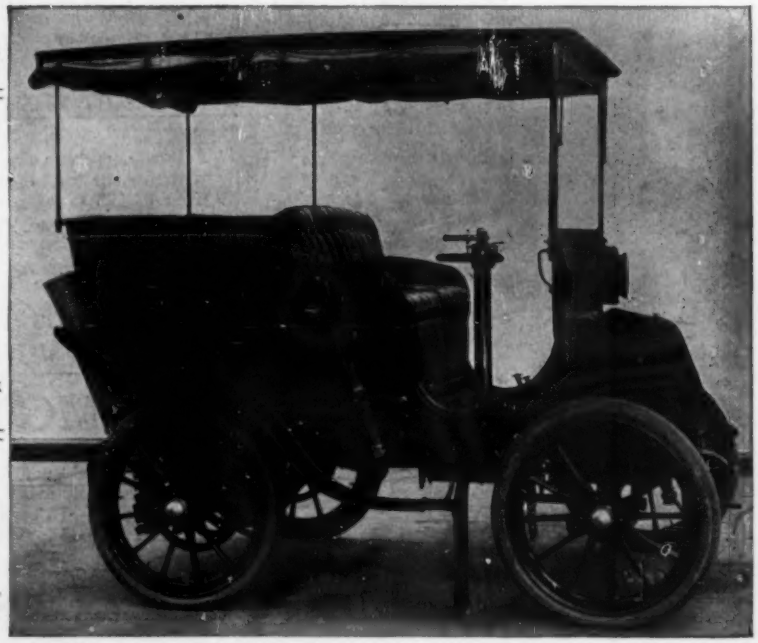

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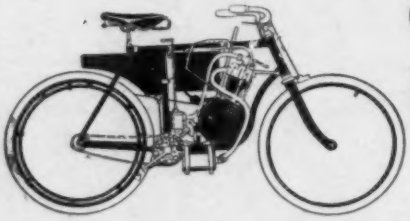

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Speed over 40 miles per hour.
The Most Powerful Motor Bicycle in the World.
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"RUBBER NECK" GENTS'.
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All our "Rubber Neck" Saddles are built on strong steel foundation plates which are stamped to form, and the edges are cloth lined. The patented rubber cushions are connected to these plates, and then artistically covered with selected number one stock of soft leather in standard colors. Sewing is even and firm, and the edge stained, rubbed and polished. We make six styles of Rubber Neck Saddles.

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CHICAGO, ILL.

THE CYCLE AGE

New York, July 27.—There was all-around record breaking galore at Vailsburg today. Hurley started the ball rolling by reducing Mike Coffee's 29 seconds for the quarter mile to 28 3-5, with a flying start. The N. C. A. now makes no distinction between standing and flying starts in the record table. Billington was second and Dove third.

Next came young Walter Smith, of Brooklyn, with 1:26 2-5 for a paced mile behind Walthour's tandem, which is the Orient single made over into a tandem, on which as a single C. H. Metz made a straightaway world's record of 1:10 on Staten Island on May 30 last. Smith formerly held the official record of 1:28, though Joe Nelson in a trial at Vailsburg just before turning "pro" covered the distance in 1:26 3-5.

A half an hour later Smith made a 5-mile trial and wiped out the entire string of figures held by Joe Nelson. The new string is: One mile, 1:25 3-5; 2 miles, 2:53 1-5; 3 miles, 4:23; 4 miles, 5:52 3-5; 5 miles, 7:18 3-5. The old figures were 1:28, 3:03 3-5, 4:36 4-5, 6:11 1-5 and 7:45.

The greatest record-breaking feat of the day, however, was Willie Fenn's performance in the 10-mile handicap. Fenn is the 5-mile national champion, and also holds a world's record of 10:15 for 5 miles in competition, made from scratch, in a handicap at Vailsburg last year. The 10-mile record previous to today was 23:12 2-5, made by Kramer at Vailsburg October 6, 1901, from scratch in a handicap.

To get a chase of any length in a 10-mile handicap run on a quarter-mile track was today's problem. An attempt at its solution was made by bunching fifteen men on the limit at 380 yards, with the other bunches 80 yards apart from scratch to 240 yards. The big bunch on the limit with lap prizes and the long jump of 140 yards for the nearest string to catch it was its theory.

Forty men started, with Collett, Lawson, Fenn and John Bedell on scratch. The limit lot made a desperate effort to catch the scratch quartet, which was only 60 yards away, and spoil the handicap.

For a mile it was within 15 or 20 yards of doing so, but at that point it fell back beaten off, and the danger was over. At about 2 miles the scratch four had caught the 80-yarders and the 160 and 240-yard strings had bunched. Not until 4 miles did the middle brigade catch the limit men, and it was a mile more before the back bunch closed the gap. At the bell Bald made a run on the outside from quite a distance back in the ruck and got in the lead in the backstretch. The game old champion, however, was pulled down in the last turn. Fenn assumed the lead at the head of the stretch and won with a little open daylight to spare. His pursuers were bunched at the finish in this order: Menus Bedell (240), Floyd Krebs 160), Martin (160), Tom Butler (80). The time was 21:53 1-5, which beats Kramer's record over a minute. It is a fit companion record to Fenn's own 10:15 for 5 miles. Fenn's average going was a shade over 2:11 for the mile for 10 miles.

The mile consolation for those who had not won a first-money prize at Vailsburg this year went to Lawson, in 2:08 3-5, with Rutz second, Newkirk third and John Bedell fourth.

Hurley (scratch) won the 2-mile amateur handicap in the fast time of 4:14 3-5. Goerke (60) was second, Gleason (scratch) third and Billington (scratch) fourth.

WEEK'S REPORT OF EUROPEAN RACES.

The annual "Bol d'Or," or 24-hour race, organized in 1894, and since then one of the classic events of Europe, was run on July 13 and 14 and resulted in an easy victory for Constant Huret, who was the winner in '94, '95 and '98. This year the starters were Huret, Gougoltz, Bouhours, Fisher, Wattelier, Petit-Breton and Vendredi. During the first and last 2 hours pacemakers was allowed. Huret took the lead and easily kept it, although he met with accidents from time to time. Bouhours had a fall during the first half hour and was badly hurt. During the night the event was very monotonous and spectators fell asleep. Huret covered less than 500 miles. His nearest competitor, Petit-Breton, was 30 miles behind, while Fisher was third.

At Cologne, Germany, 9,000 spectators yelled themselves hoarse encouraging Robl in the two heats of his match with Tom Linton. In the first heat, 10 kilometers, the German won by 1 kilometer, while in the second, a one-hour contest, he lapped Tom seven times. The crowd was so jubilant that it sang the German national hymn several times.

Most of the professional riders took part in a 2-days' meeting at Leipzig on July 13 and 14. The winners of the semi-finals were Jenkins, who defeated Rutt, Jacquelin and Eros; Meyers winning from Mayer and Schilling, Buisson leaving M. Mayer and Arend behind him. In the final Rutt took the lead after the bell and won in grand style, Meyers being second.

It was all for Ellegaard at Copenhagen on the 14th. He won the scratch race from Vanden Born and Jue by five lengths, the lap race by a lap and the tandem race, with Vanden Born, without much trouble.

STANDING OF CHAMPIONSHIP ASPIRANTS.

Frank Kramer's lead in the national circuit championship series increases with every race run. Up to and including Vailsburg last Saturday he had won seven straight victories, one of them a double point national championship. It was expected that Major Taylor would make a rapid climb up the ladder after Kramer. The colored boy started well, with a close second to the champion at Washington on Wednesday, but foolishly rode in a pocket at Vailsburg on Saturday and finished fourth, with but one point to his credit.

Owen Kimble, the veteran, whose riding is the surprise of the circuit, still holds second place, having

failed to reach the final heat entrance. Saturday he increased his lead over Lawson and Colbert for "runner-up" honors by finishing second to Kramer.

With four prizes in the championship race, five in the handicap and four in the consolation at each meet, the money is being well split up among the circuit chasers. It is just and likely that the consolation will hereafter be restricted to those who have regularly entered for the championship and are compelled to follow the entire circuit. Local professionals, who for the most part have other employment, should not be given a chance for consolation emoluments, which belong to those who are bearing the brunt and expense of the continuous journey and struggle.

The standing of the men entered for the championship on a basis of five for first, three for second, two for third and one for fourth, with double points in national championship races, up to and including the meet at Vailsburg July 26, is as follows:

	1sts.	2ds.	3rds.	4ths.	Points.
Kramer	7	0	0	0	40
Kimble	0	2	2	2	15
Lawson	0	3	1	1	12
Collett	0	1	2	2	10
Taylor	0	1	1	0	4
Fisher	0	0	1	0	4
Bald	0	0	1	0	2
Wilson	0	0	0	0	1

The circuit will be at New Haven on Tuesday and will then go to Ottawa for August 1, 2 and 4, with a circuit championship race each day.

TAYLOR FALLS INTO A TIGHT TRAP.

Newark, N. J., July 26.—Major Taylor must learn to ride nearer the front or on the outside if he would keep the nose of his bicycle out of such pockets as he fell into in the half-mile circuit championship race at Vailsburg on Saturday. That he got into the pocket in the final and could not have gotten through at the tape, no matter what speed he had, was his own fault. Nowadays racers do not pull out to let men through.

At the bell Kimble led, with Kramer second, Taylor third and Lawson fourth. Of course when the sprint came on the backstretch Kramer came alongside of Kimble and Lawson moved up beside Taylor. Kramer passed Kimble at the turn, but the pocket still existed and Taylor sat up 10 yards from the tape. Taylor and Lawson bumped at the start and the Major went off the track, but was quickly back again, without any loss. This bumping and the pocket, of course, caused the inevitable howl that always goes up when the Major is beaten. Taylor himself confessed to his own fault and refused to make a protest. Four men racing is a different game from a two-man match. Kramer is always in the lead at the critical moment. Taylor never takes pains to be. Kimble was second and Lawson third.

A field of thirty-seven started in the two-mile handicap for money chasers. John Fisher, the Chicagoan, won from the 60-yard mark in 4:07 3-5, with Keegan (210) second, Taylor (scratch) third, William Martin (120) fourth and John Bedell (30) fifth. The entire field was bunched at the tape.

Fenn captured the mile consolation in 2:05 2-5, with Mettling second, Schreiber third and Floyd Krebs fourth.

Walter Smith, the mile record holder, beat Fred Dahlke, the amateur champion pace follower, in a heat race at 3, 5 and 3 miles behind single pace. The men tossed for pacing machines each time. The final was won by 5 yards.

Billington won the New Jersey amateur mile championship handily in 2:05 3-5, with single pace to the last quarter. Zanes and Gleason followed him in order. The latter, as usual, ran himself to a standstill by attempting too long a sprint.

Charley Schlee won the 5-mile handicap from 50 yards in 11:28 2-5, Gleason (scratch), Billington (scratch) and J. F. Brown (200) following him in order.

MICHAEL FORSAKES THE HORSES ONCE MORE

Paradoxical as it might seem, lovers of cycle racing will be glad and sorry to learn that Jimmy Michael has again quit the turf to return to the bicycle. They will be glad because he is a favorite among the followers of the sport. They will be sorry because the little Welshman has certainly tried hard to attain success as a jockey, and it is always regretful to see a well-aimed purpose come to naught. As a member of the Columbia cycling team last year Michael was certainly riding faster than any other man on the small tracks. It was generally admitted that in September and during the meets at Madison Square Garden, New York, the "Welsh Rarebit's" speed compared favorably with any other man following the motor tandems. Michael's second failure at the horses may cure him forever of the fever that has cost him so much time and money at a period in his life when he could have been making thousands of dollars.

Three years ago, at the height of his career awheel, the diminutive bundle of muscle from Wales relinquished his hold on the championship crown and invested his money in running horses. An unsuccessful season on the turf apparently cured him of the ambition to become a famous jockey, and he returned to the banked bicycle tracks. To the wonder of athletic followers particularly, and the public generally, Michael soon proved that he had the strength, grit and speed to win at cycle racing again, although it could not be said that he had developed championship form until he had gone through many months of hard training.

Last fall he again deserted the wheel for horse racing, going to Paris, where he secured the mounts on many of the best horses and for a time seemed to have struck the inside of the game. Of late, however, he has had little success on the Parisian tracks and the cable reports state that he has gone to the Parc des Princes Track to train on the wheel behind tandems and subsequently to come to America.

MOTOR CYCLE RELIABILITY AND ECONOMY.

New York, July 28.—Rules for the combination 50-mile race and economy test to be promoted by the New York Motor Cycle Club at the Manhattan Beach track on August 9 have been promulgated.

The committee has decided to offer blue ribbons, to be awarded regardless of the quantity of fuel consumed. A total stoppage of 10 minutes will be permitted for the refilling of gasoline tanks, lubrication, etc. The other most vital rule deals with pedaling. After starting no contestant will be allowed to pedal

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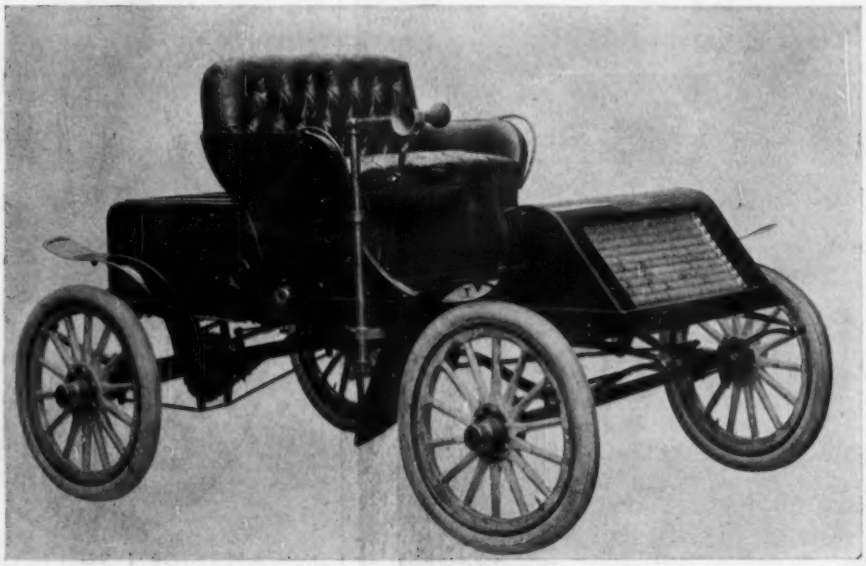

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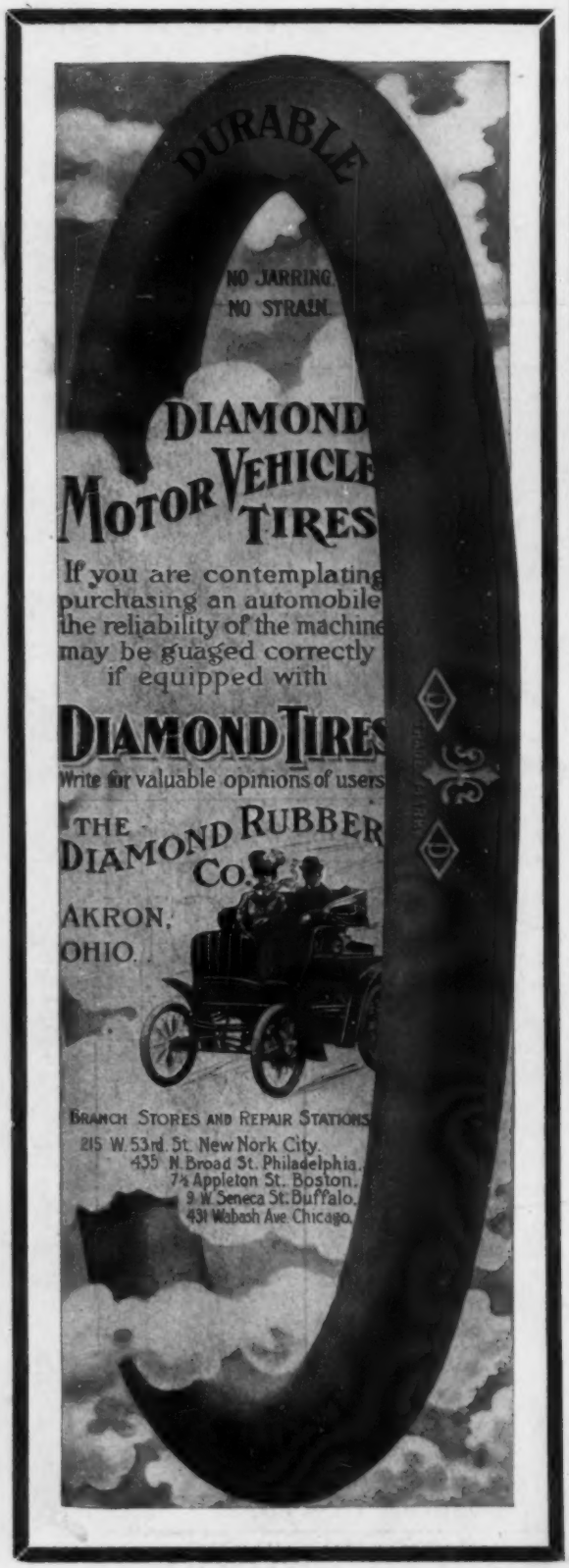

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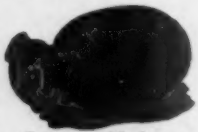

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on more than three separate occasions or to pedal more than one-half lap—the track is three laps to the mile—at any one time, this, of course, without regard to the pedaling required to start the machines after such stoppages as are legalized by the rules. Gasoline will be provided by the promoting club, competitors being obliged to deliver their machines to the judges with the tanks empty.

RAIN RUINS A PHILADELPHIA PARADE.

Drenching rain ruined the third parade promoted by the Philadelphia Cycle Dealers' Association last week. More than 2,500 bicyclists, with their machines decorated with Japanese lanterns, flags, bunting and flowers, were drenched. Fully 5,000 persons who came out to see the procession also got wet.

Decorating and festooning had been going on for a week, and it had been announced that the parade would be a gorgeous affair. It was. In the city hall courtyard fully a hundred gorgeous bicyclists stood while the rain came down in torrents. The color in the conspicuous uniforms they wore began to run. Some of them had blue hands and faces, others looked like Indians, and some were streaked with green and yellow. It was unanimously decided that the display was gorgeous.

The parade started at Broad street and Girard avenue at 8 o'clock. Three of the eight divisions had passed by city hall and a few of the leading cylists had reached Washington avenue and had started back when the rain came.

Among the clubs that turned out was the Eagle Cycling Club, of the Northwestern section. The aggregation was led by Street Sergeant Tweston, of the Twentieth and Berks streets police station. Each member was accompanied by a woman and all wore brilliantly-hued costumes. Many floats were in line.

At Broad and Chestnut streets the judges sat in a huge coach waiting to award the prizes. But the rain came and relieved them of that privilege. They retired and the parade was declared off officially at 9:15 o'clock. The committee in charge of the affair announced that it would select a clear night for the holding of another parade.

Walthour Continues Victorious Career.

Boston, Mass., July 24.—Walthour won a four-cornered 25-mile motor-paced race at Charles River park to-night, riding the distance in 35:02 3-5. Maya was second, three and one-half laps behind, beating out Munro, who was third by about 200 yards. Hall was hopelessly last.

Major Taylor finished second to Kraemer in his first race for the national championship at the Circuit meet at Washington before 2,500 people. In the mile handicap Taylor rode himself out, setting pace to catch the limit men, and didn't finish. Bald and Williams won the heats handily. The final resulted almost in a dead heat between Williams and Schreiber.

Great Demand for Columbia Motor Bicycles.

Hartford, Conn., July 27.—The Columbia branch of the American Cycle Mfg. Co. is now engaged chiefly in turning out motor bicycles. The trade in ordinary bicycles for this year is practically over at the factory end, but the motor bicycle trade is not regulated by season to any appreciable extent and the local factory is turning them out as fast as possible. At present 600 hands are employed, all working full time, and the usual midsummer reduction in the working force has not been made nor will it be, judging from present indications. Motor bicycles are being shipped as fast as they can be made. It is said that the demand is for even more and that if a larger number could be made they would find ready shipment. So far as can be foreseen there is no prospect of a diminution in activities at the Pope factory for some time to come.

New Jersey Division of L. A. W. Abolished.

By vote of the executive committee of the League of American Wheelmen the once powerful New Jersey division of the organization has been abolished. For two years the officers in that state have done little, if anything, for the league, hence the drastic procedure of the national officials. At their meeting during the Atlantic City meet the latter decided that a strenuous policy was necessary to reinvigorate the organization and the wiping out of the New Jersey division is the first move in that direction. It is believed to foreshadow a general shake-up of the league. In other states in which apathetic officers retain titles but perform no service it is expected that the axe will also fall and their affairs be taken over by the national officials until aggressive men are found in the several districts.

Champion's Record Beaten by Walthour.

New York, July 26.—Bobbie Walthour rode 20 miles in 28:52 2-5 and broke all of Albert Champion's records for the track in the four-cornered motor-paced race at Manhattan Beach today. Freeman was second and McFarland third. There were three quarter-mile gaps between Walthour and Freeman and Freeman and McFarland at the finish. Benny Munroe fell at 8 miles, when in second position, though almost a lap behind Walthour.

Hurley won both the amateur events, the half-mile open and the 2-mile handicap, in 4:28 1-5.

Walter T. Smith, Sr., and S. W. Anderson, both of Brooklyn, had a warm race of it for 5 miles in the motor cycle amateur open. The former won by a foot in 8:07.

What Will the Top Tube Carry?

The makers of the De Long motor bicycle take exception to MOTOR AGE's question whether the top tube of the frame which carries the gasoline will, as stated by them, carry enough for a 50-mile run, and have notified the paper that it "must have been asleep." That, however, doesn't alter the fact that it takes a certain amount of gasoline to do a certain amount of work. If the motors are fairly economical their size, within a reasonable limit, will make little difference. For instance, the Mitchell motor is 3x3 and last year's Thomas was only about half that cylinder capacity, yet both machines carried the same amount of gasoline and had practically the same distance capacity, as the little motor had to run at a rate sufficiently high to even up the amount of vapor consumed. The consumption of these motors was about a gallon to 60 miles. This year's Auto-Bi, which is between the two above referred to in size, has about the same consumption, which does not make it appear that a 50-mile charge can be carried in a frame tube of anything like normal dimensions.

After three unsuccessful attempts A. A. Hansen, of Minneapolis, on the 23rd completed a 1,000-mile ride on a motorcycle against time, the elapsed time being 72h. 26m. 50s.; actual riding time, 54h. 59m. 30s. This is believed to be the fastest road ride of that distance on record on any vehicle that does not run on a prepared track.

A director of the American Bicycle Co. is reported to have said, after last Tuesday's meeting had adjourned for 2 weeks, that when the meeting reconvened some announcement might be expected relative to a change in the presidency.

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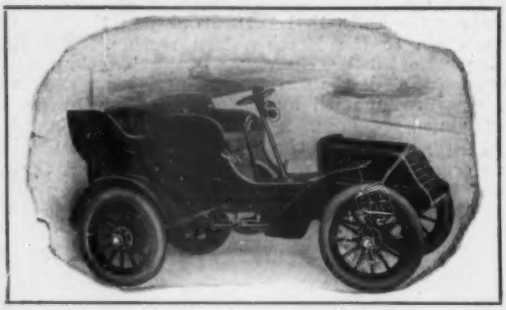

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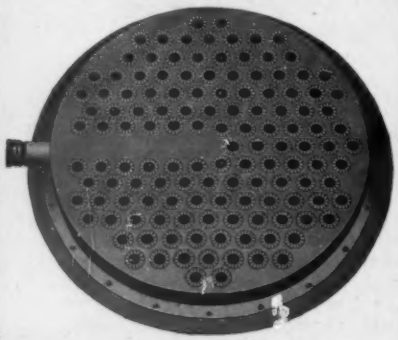

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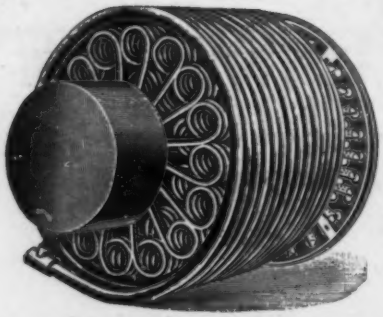

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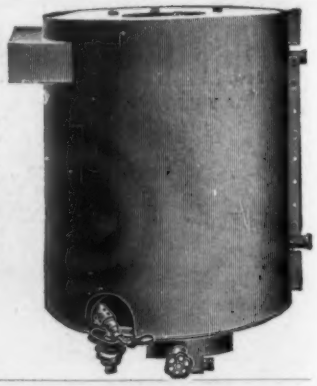

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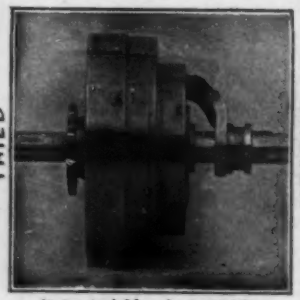

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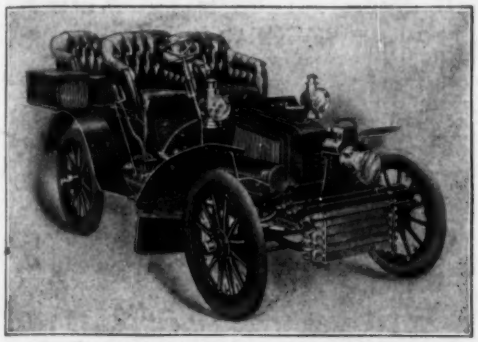

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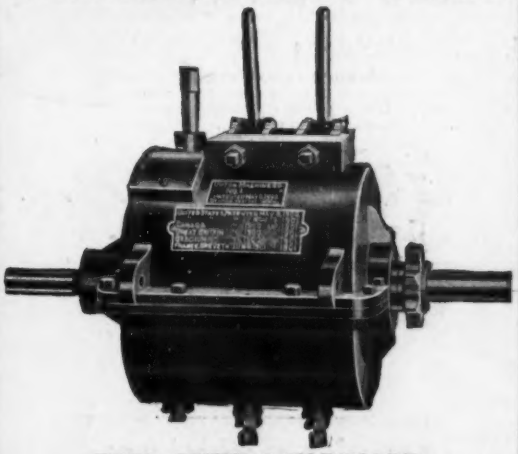

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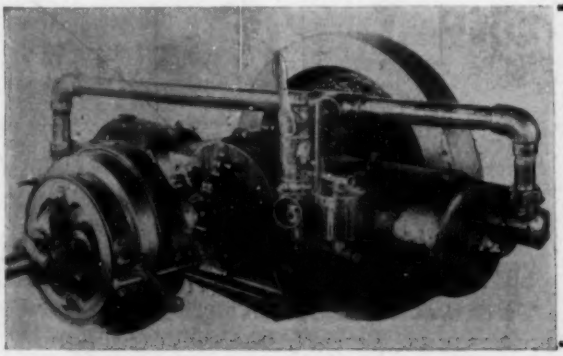

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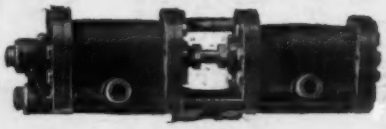

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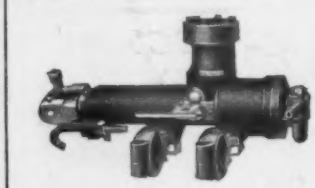

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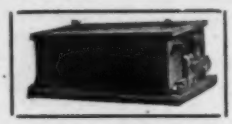

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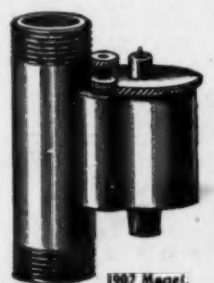

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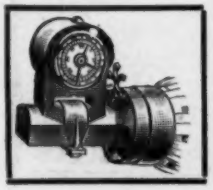

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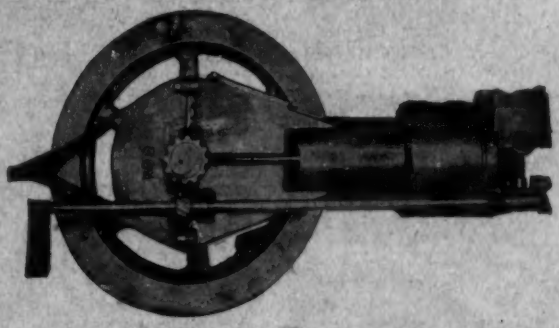

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